HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW20

Project: Fort McClellan | Geologist: Adam Day | Sheet 11 of 12 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		veins, little Shale banding at 93.6' bgs. Fractures: 93.4' (break), 93.6' (~45 degrees with calcite on fracture face, fissile), 93.9' (~45 degrees, calcite on fracture face).			= 0.0ppm				Ran 5.0', Rec 5.0' Loss 0.0' UL 0.0' Water used: ~200 gal, rec 90% RQD 92%
	92								92
	93		ls						93
	94					Box 8 of 9 (93.7 to 103.1' bgs)			94
475									
	95								95
	96	ls: LIMESTONE, dark gray, moderately hard, moderately weathered, some contorted calcite veins, microcrystalline, little Shale in parted beds. Fractures: 96.1' (~45 degree, fissile Shale and calcite), 99.4' (~45 degree).			Organic Vapor = 0.0ppm			CD 96.0'	96 Run 15 (96.1-101.1' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: ~200 gal, rec 95% HP 750 psi WP 90 psi RQD 98%
	97								97
	98								98
			ls						
	99								99
470									
	100								100
	101	ls: LIMESTONE, dark gray, moderately hard, moderately weathered, some contorted calcite veins, microcrystalline, little Shale in parted			Organic Vapor =			CD 101.0'	101 Run 16 (101.1-106.1' bgs) Ran 5.0' Rec 4.8'

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW20

Project: Fort McClellan | Geologist: Adam Day | Sheet 12 of 12 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		beds. Fractures: 101.4' and 105.0' (~45 degrees).			0.0ppm				Loss 0.2' UL 0.0' Water used ~200 gallons, rec ~200 gallons HP 750psi WP 90psi RQD 94%
	102								102
	103		ls			Box 9 of 9 (103.1 to 105.8' bgs)			103
	104								104
465									
	105								105
								CD 105.8'	Bottom of borehole at 105.8' bgs

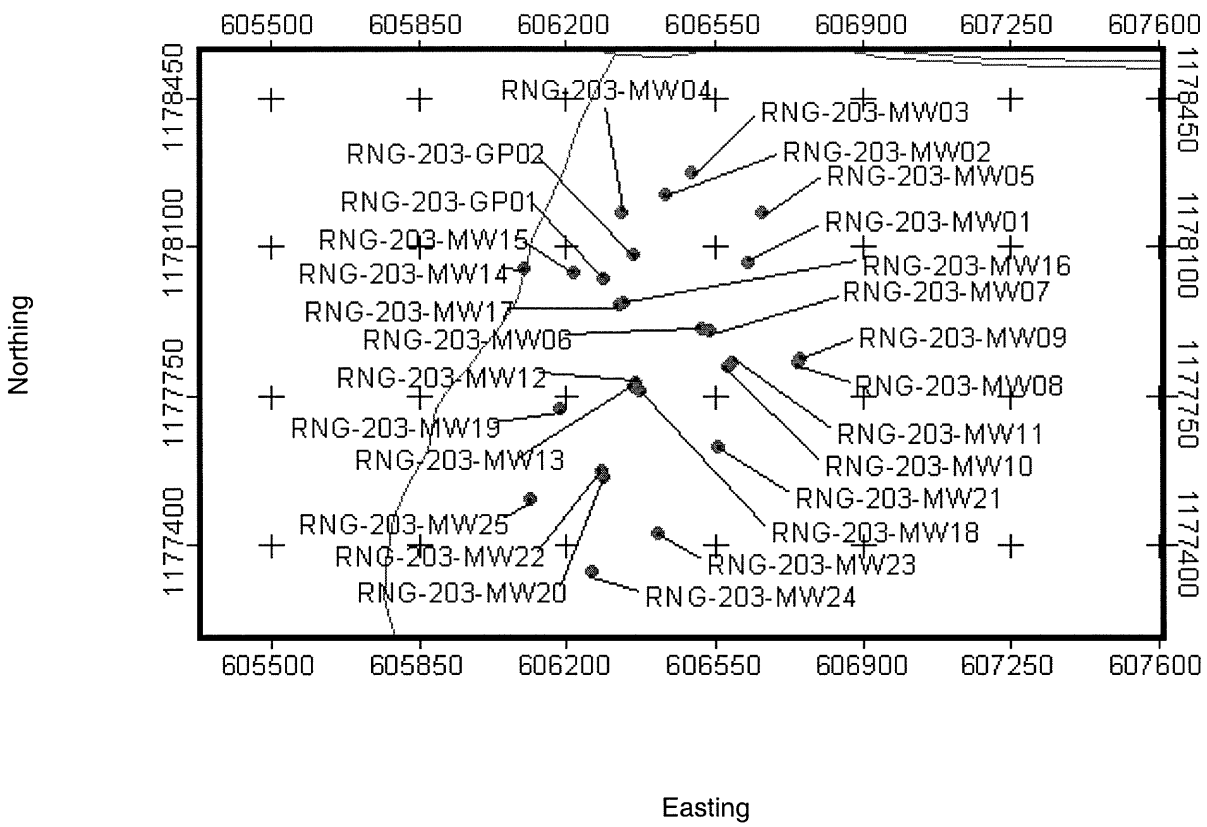
HTRW DRILLING LOG

	District: **Mobile USACE**	**HOLE NUMBER** RNG-203-MW21
1. Company name: **Shaw Environmental, Inc.**	2. Drill Subcontractor: Miller Drilling Company	Sheet 1 of 11 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Glen Bilbrey/Stephen Keener	6. Mfr. designation of drill: CME-750X/Schramm T450WS
7. Sizes and types of drilling and sampling equipment: Hollow Stem Auger, Air Rotary, PQ Barrel Coring HSA - 5"x4.25" ID Augers, 2'x2" Steel Split Spoons Ar - 7.875" Air Hammer and Tri-cone Roller Bit PQ - 5'x4" PQ3 Wireline Core Barrel	8. Hole location: Range K, Parcel 203(7) 9. Surface elevation (feet above mean sea level): 578.92 10. Date started: 08/13/02 — 11. Date completed: 08/28/02
12. Overburden thickness (feet bgs): 29	15. Depth groundwater encountered (feet bgs): 25.9
13. Depth drilled into rock (feet bgs): 72.2	16. Depth to water and elapsed time after drilling completed (feet bgs): 9.6
14. Total depth of hole (feet bgs): 101.2	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: 8		
	NA	NA	NA			
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
	NA	NA	NA	NA	NA	73.9
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
	NA	4" Permanent	NA	Adam Day		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW21

Project: Fort McClellan | Geologist: Adam Day | Sheet 2 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	0	cl: Yellowish orange to light brown, dry, soft to medium stiff CLAY, little Silt, trace fine Sand.	cl		Organic Vapor = 0.5ppm			3 5 7 9	HSA - Miller Drilling Company - 8/13/02 Rec 2.0'/2.0' (0-2' bgs)
	2	cl: Yellowish orange to light brown mottled, dry, medium stiff to stiff CLAY, little Silt, trace fine Sand.	cl		Organic Vapor = 0.0ppm			12 15 19 26	Rec 2.0'/2.0' (2-4' bgs)
575	4	cl: Reddish orange to yellowish orange to light brown mottled, dry, very stiff to hard CLAY, trace fine Sand, little Silt, trace black to reddish brown manganese or iron nodules.	cl		Organic Vapor = 0.0ppm			26 33 34 36	Rec 2.0'/2.0' (4-6' bgs)
	6		cl		Organic Vapor = 0.0ppm			38 36 38 38	Rec 2.0'/2.0' (6-8' bgs)
	8		cl		Organic Vapor = 0.0ppm			26 45 41 36	Rec 2.0'/2.0' (8-10' bgs)
570	10		cl		Organic			28 31	Rec 0.8'/2.0' (10-12' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW21

Project: Fort McClellan | Geologist: Adam Day | Sheet 3 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		cl: Reddish orange to yellowish orange to light brown mottled, dry, very stiff to hard CLAY, trace fine Sand, little Silt, trace black to	cl		Vapor = 0.0ppm			31 34	
	11	NA: No recovery.	NA						
	12	NA: No sample collected for lithologic description.							
	13		NA						
565	14								
	15	cl: Yellowish orange to light brown mottled, very soft to medium stiff, dry CLAY, little Silt, trace Sand, trace black to reddish brown iron or manganese nodules.	cl		Organic Vapor = 0.0ppm			1 3 5 7	Rec 2.0'/2.0' (15-17' bgs)
	16								
	17	NA: No sample collected for lithologic description.							
	18		NA						
560	19								
	20	cl: Yellowish orange to light brown mottled,			Organic Vapor			1 2 3 5	Rec 2.0'/2.0' (20-25' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW21

Project: Fort McClellan | Geologist: Adam Day | Sheet 4 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		very soft to medium stiff, moist CLAY, little Silt, trace Sand, trace black to reddish brown			= 0.0ppm				
	21		cl						
	22	NA: No sample collected for lithologic description.							
	23		NA						
555	24								
	25	cl: Yellowish orange to light brown mottled, very soft to medium stiff, moist CLAY, little Silt, trace Sand, trace black to reddish brown nodules.	cl		Organic Vapor = 0.0ppm			2 2 53 0.3	Rec 1.3'/1.3' (25-26.3' bgs)
	26	sc: White to light gray, wet, very dense, coarse limestone SAND, some white to light gray, hard, unweathered, angular, microcrystalline limestone Gravel.	sc						Groundwater encountered at 25.9' bgs
	27	NA: No sample collected for lithologic description.	NA						
	28								
550	29	ls: LIMESTONE, moderately hard, moderately weathered, thick bedding, highly fractured, microcrystalline to crystalline, fossiliferous (shells), sutures throughout, medium light gray. Fractures: 29.9', 30.2', 30.4' bgs dipping ~90 degrees, iron staining and trace reddish orange Clay in fractures.			Organic Vapor = 0.0ppm	Box 1 of 8 (29.0 to 38.0' bgs)		CD 29.0'	PQ Coring - Miller Drilling Company - 8/14/02 Run 1 (29.0-31.0' bgs) Ran 2.0' Rec 2.0' Loss 0.0' UL 0.0' Water used: 550 gal, rec 100% HP 500psi WP 50psi Time: 11 min RQD 60%
	30		ls						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW21

Project: Fort McClellan | Geologist: Adam Day | Sheet 5 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	31	ls: LIMESTONE, moderately hard, slightly weathered, microcrystalline to crystalline, highly fractured, medium light gray to medium gray. Fractures: 32', 33', 33.4', 34.4', and 34.6' dipping ~ 30 degrees along thin bedded planes, contorted calcite-infilled vein from 31.0' to 34.4', iron staining in fractures.	ls		Organic Vapor = 0.0ppm			CD 31.0'	Run 2 (31.0-36.0' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 330 gal, rec 100% HP 1000psi WP 50psi Time: 19 min RQD 92%
	32								
	33								
545	34								
	35								
	36	ls: LIMESTONE, moderately hard, unweathered, microcrystalline to crystalline, thinly bedded, contorted bedding dipping at ~30 degrees, highly fractured along bedding planes, medium light gray to medium gray. Fractures at: 36.2', 36.4', 37.6', 38.8', 39.9', 40.3', and 40.8'.	ls		Organic Vapor = 0.0ppm			CD 36.0'	Run 3 (36.0-41.0' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 200 gal, rec 100% HP 1000psi WP 50psi Time 16 min RQD 92%
	37								
	38					Box 2 of 8 (38.0 to 44.8' bgs)			
540	39								
	40								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW21

Project: Fort McClellan | Geologist: Adam Day | Sheet 6 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	41	ls: LIMESTONE, moderately hard, unweathered, microcrystalline to crystalline, thin bedded, contorted bedding dipping at ~ 30 degrees, medium light gray to medium gray, fossiliferous. Fractures: 41.4', 42.0', and 43.6' along contorted bedding planes dipping at 30 degrees.	ls		Organic Vapor = 0.0ppm			CD 41.0'	Run 4 (41.0-44.7' bgs) Ran 3.7' Rec 3.7' Loss 0.0' UL 0.0' Water used: 100 gal, rec 100% HP 1000psi WP 50psi Time 11 min RQD 100%
	42								
	43	ls: LIMESTONE, hard, slightly weathered, microcrystalline to crystalline, thinly bedded dipping ~30 degrees, highly fractured, iron staining in fractures, light gray to medium gray, fossiliferous. Fractures: 43.4', 44.8', 45.3', and 45.8' dipping ~30 degrees along bedding planes. From 43.6 - 43.9', medium gray shaley LIMESTONE, microcrystalline, parted bedding in fracture zone from 43.6' - 43.9' bgs. Entire core section mottled with medium gray DOLOMITIC LIMESTONE.			Organic Vapor = 0.0ppm			CD 42.2'	Hole was offset due to core barrel locking in augers Run 5 (42.2-46.2' bgs) Ran 4.0' Rec 3.7' Loss 0.3' UL 0.3' Water used: 350 gal, rec 100% Time: 15 min RQD 86.4%
535	44		ls						
	45					Box 3 of 8 (44.8 to 54.3' bgs)			
	46								
	47	ls: LIMESTONE, hard, slightly weathered, microcrystalline to crystalline, thinly bedded dipping ~30 degrees, highly fractured, iron staining in fractures, light gray to medium gray, fossiliferous. Fractures: 6.4', 46.6', 47.0', 47.3', 47.7', and 48.1' dipping 30 degrees along bedding planes.			Organic Vapor = 0.0ppm			CD 46.5'	Run 6 (46.2-51.2' bgs) Ran 5.0' Rec 4.8' Loss 0.2' UL 0.0' Water used: 375 gal, rec 100% HP 1000psi WP 50psi Time: 30 min RQD 95.1%
	48								
530	49		ls						
	50								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW21

Project: Fort McClellan | Geologist: Adam Day | Sheet 7 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	51	ls: LIMESTONE, moderately hard, microcrystalline to crystalline, unweathered, thinly bedded, highly fractured , light gray to medium gray, fossiliferous, vertical calcite veins. Fractures: 52.1', 52.7', 53.2', 53.6' - 53.7', 54.7', and 55.7' dipping ~30 degrees along bedding planes. Entire section is mottled with DOLOMITIC LIMESTONE, hard, microcrystalline, medium gray to medium dark gray.	ls		Organic Vapor = 0.0ppm	Box 4 of 8 (54.3 to 62.6' bgs)		CD 51.0'	Run 7 (51.2-56.2' bgs) Ran 5.0' Rec 5.1 Loss 0.0' UL 0.3' Water used: 550 gal, rec 100% HP 700psi WP 50psi Time: 32 min RQD 98%
	52								
	53								
525	54								
	55								
	56	NA: No recovery.	NA						
	57	ls: LIMESTONE, moderately hard, microcrystalline to crystalline, unweathered, thin bedded (0.1'), highly fractured, light gray to medium gray, fossiliferous, vertical calcite veins, mottled with dolomite or dolomitic LIMESTONE, hard, microcrystalline, medium gray to medium dark gray. Fractures at 57.2', 57.7', 58.1', 58.4', 59.0', 59.25', 59.8', 60.2', 61.0' dip 30 degrees along bedding planes, clay in fracture at 59.0' and 59.25'.	ls		Organic Vapor = 0.0ppm			CD 56.4'	Run 8 (56.2-61.2' bgs) Ran 5.0' Rec 5.1' Loss 0.2' UL 0.0' Water used: 300 gal, rec 100% HP 800psi WP 50psi Time: 35 min RQD 89.2%
	58								
520	59								
	60								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW21

Project: Fort McClellan | Geologist: Adam Day | Sheet 8 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	61								
		ls: LIMESTONE, moderately hard, microcrystalline to crystalline, unweathered, thin bedded (0.1'), highly fractured, light gray to medium gray, fossiliferous, vertical calcite veins, mottled with dolomite or dolomitic LIMESTONE, hard, microcrystalline, medium gray to medium dark gray. Fractures at 61.4', 62.0', 62.4' - 62.5', 63.7' dip 30 degrees along bedding planes, iron staining in fracture at 62.4' - 62.5' bgs.	ls		Organic Vapor = 0.0ppm	Box 5 of 8 (62.6 to 71.2' bgs)		CD 61.2'	Run 9 (61.2-66.2' bgs) Ran 5.0' Rec 5.1' Gain 0.1' UL 0.0' Water used: 600 gal, rec 100%, light gray HP 800psi WP 50psi Time: 27 min RQD 94.2%
	62								
	63								
515	64								
	65								
	66								
		ls: LIMESTONE, moderately hard, microcrystalline to crystalline, thin bedding, moderately jointed (fractured), unweathered, fossiliferous, light gray to medium dark gray. Fractures at 67.7'-67.8', 68.1' - 68.2', 69.7' dip at 30 degrees along thin (0.1') bedding planes.	ls		Organic Vapor = 0.0ppm			CD 66.3'	Run 10 (66.2-71.2' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.2' Water used: 375 gal, rec 100% HP 1000psi WP 50psi Time: 26 min RQD 96%
	67								
	68								
510	69								
	70								
	71								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW21

Project: Fort McClellan | Geologist: Adam Day | Sheet 9 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		NA: No recovery.	NA		Organic Vapor = 0.0ppm	Box 6 of 8 (71.2 to 81.2' bgs)		CD 71.5'	Run 11 (71.2-76.2' bgs) Ran 5.0' Rec 4.9' Loss 0.1' UL 0.0' Water used: 450 gal, rec 100% HP 1000psi WP 50psi Time: 28 min RQD 100%
	72	ls: LIMESTONE, moderately hard, unweathered, microcrystalline to crystalline, thin bedding, moderately fractured, light gray to medium dark gray, fossiliferous. Fractures: 72.4', 73.9', and 74.9' dipping ~90 degrees. Beds have become thicker and bedding planes and fractures are suture-like (contorted).							
	73								
505	74		ls						
	75								
	76								
		ls: LIMESTONE, moderately hard, microcrystalline to crystalline, moderately fractured, light gray to medium dark gray (darker mottled areas are more dolomitic), fossiliferous. Fractures: 77.4' and 79.3' dipping ~20 degrees, 79.8' dipping ~60 degrees, stress fractures (hairline) from 79.3' to 80.3' with thin contorted bedding.			Organic Vapor = 0.0ppm			CD 76.4'	Run 12 (76.2-81.2' bgs) Ran 5.0' Rec 4.8' Loss 0.2' UL 0.0' Water used: 375 gal, rec 100% HP 1000psi WP 50psi Time: 19 min RQD 100%
	77								
	78								
500	79		ls						
	80								
	81								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW21

Project: Fort McClellan | Geologist: Adam Day | Sheet 10 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	82	ls: LIMESTONE, moderately hard, microcrystalline to crystalline, moderately fractured, contorted thin bedding, light gray to medium dark gray (darker mottled areas are more dolomitic), fossiliferous. Fractures: 82.3' and 84.0' dipping ~20 degrees, 84.9' dipping ~40 degrees.	ls		Organic Vapor = 0.0ppm	Box 7 of 8 (81.2 to 91.2' bgs)		CD 81.2'	Run 13 (81.2-86.2' bgs) Ran 5.0' Rec 5.1' Gain 0.1' UL 0.0' Water used: 425 gal, rec 100% HP 1000psi WP 50psi Time: 20 min RQD 100%
495	83								
	84								
	85								
	86								
	87	ls: LIMESTONE, moderately hard, microcrystalline to crystalline, moderately fractured, contorted thin bedding, light gray to medium dark gray (darker mottled areas are more dolomitic), fossiliferous. Fractures: 87.3', 88.6', and 89.5' dipping ~90 degrees.	ls		Organic Vapor = 0.0ppm			CD 86.3'	Run 14 (86.2-91.2' bgs) Ran 5.0' Rec 4.9' Loss 0.1' UL 0.0' Water used: 275 gal, rec 100% HP 1000psi WP 50psi Time: 14 min RQD 100%
	88								
490	89								
	90								
	91				Organic	Box 8		CD	Run 15 (91.2-96.2' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW21

Project: Fort McClellan | Geologist: Adam Day | Sheet 11 of 11 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	92	ls: LIMESTONE, moderately hard, microcrystalline to crystalline, moderately fractured, contorted thin bedding, light gray to medium dark gray (darker mottled areas are more dolomitic), fossiliferous. Fractures: 92.1',	ls		Vapor = 0.0ppm	of 8 (91.2 to 101.2' bgs)		91.2'	Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 300 gal, rec 100%, light gray Time: 12 min RQD 100%
	93								
485	94								
	95								
	96								
	97	ls: LIMESTONE, moderately hard, microcrystalline to crystalline,slightly weathered (some fractures are iron stained), contorted thin bedding dipping ~30 degrees, moderately fractured, light gray to medium dark gray (darker areas are more dolomitic), fossiliferous. Fractures: 96.2' - 96.8' and 98.9' dipping ~30 degrees.			Organic Vapor = 0.0ppm			CD 96.2'	Run 16 (96.2-101.2' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 250 gal, rec 70% HP 1000psi WP 50psi Time: 14 min RQD 90%
	98								
480	99								
	100								
	101							CD 101.2'	Bottom of borehole at 101.2' bgs

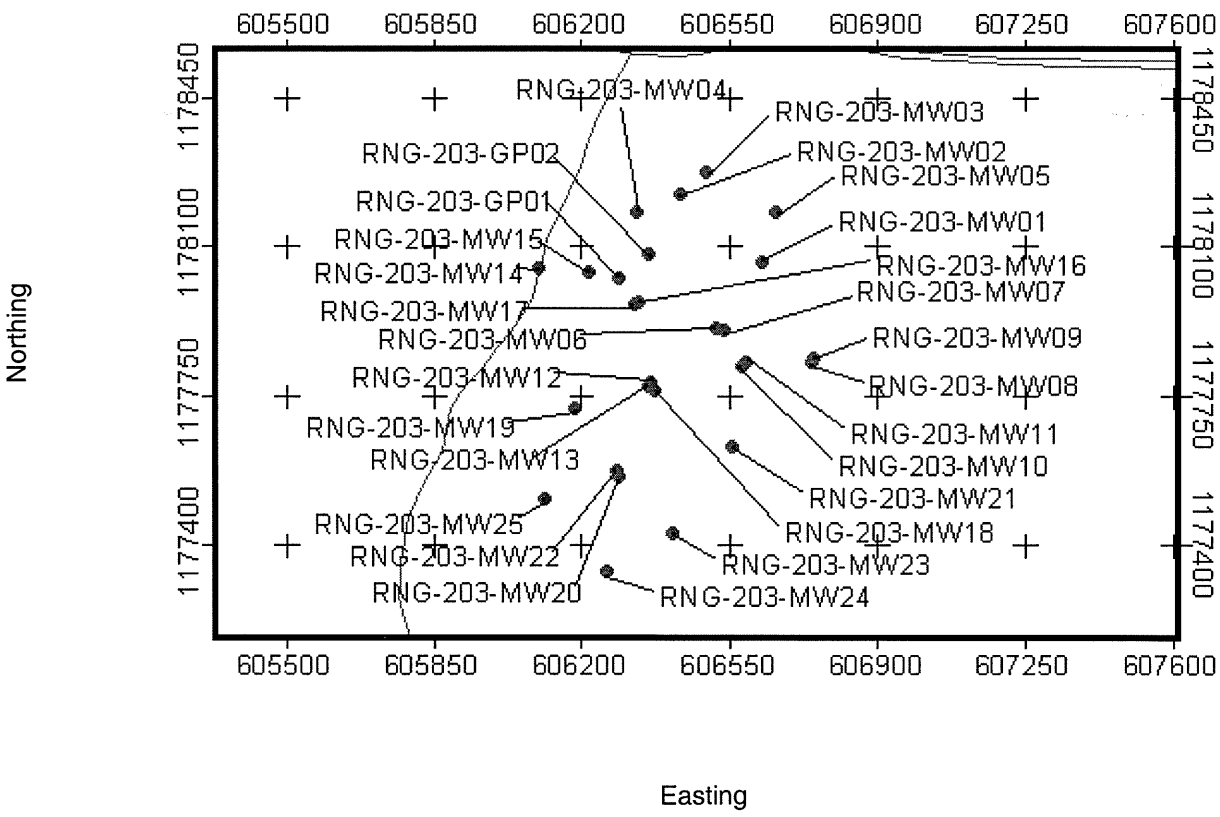
HTRW DRILLING LOG

	District: **Mobile USACE**	**HOLE NUMBER** RNG-203-MW22
1. Company name: **Shaw Environmental, Inc.**	2. Drill Subcontractor: Miller Drilling Company	Sheet 1 of 22 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Mike Martin/Glen Bilbrey	6. Mfr. designation of drill: Ingersoll Rand T3/CME-750X
7. Sizes and types of drilling and sampling equipment: Air Rotary, Triple PQ Coring AR - 12.25 and 6.25" Tri-cone Roller Bits PQ - 5'x4" PQ3 Wireline Core Barrel	8. Hole location: Range K, Parcel 203(7) 9. Surface elevation (feet above mean sea level): 569.74 10. Date started: 06/02/03 — 11. Date completed: 08/15/03
12. Overburden thickness (feet bgs): 25	15. Depth groundwater encountered (feet bgs): Unknown
13. Depth drilled into rock (feet bgs): 185	16. Depth to water and elapsed time after drilling completed (feet bgs): 10.9 on 8/20/03
14. Total depth of hole (feet bgs): 210	17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: 12		
	NA	NA	NA			
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
	NA	NA	NA	NA	NA	99.0
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
	NA	2.5" Permanent	NA	Adam Day/Kyle Wilson		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 2 of 22 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	0	ml: Dark brown, moist, loose SILT, little Clay.	ml						Air rotary - Miller Drilling Company - 6/2/03
		cl: Yellowish orange to light brown, soft, moist CLAY, little Silt, trace fine Sand.							Lithologic description from RNG-203-MW20 (0-103.5' bgs)
	1		cl						
		NA: No recovery.	NA						
	2	cl: Yellowish orange to white to light brown, mottled, dry, medium stiff to stiff CLAY, little Silt, trace fine Sand, trace reddish brown nodules.							
	3		cl						
	4	cl: Yellowish orange to white, mottled, dry, stiff to very stiff CLAY, trace Silt, trace reddish brown nodules.							
565	5								
	6		cl						
	7								
		NA: No recovery.	NA						
	8	cl: Yellowish orange to white, mottled, dry, stiff to very stiff CLAY, trace Silt, trace reddish brown nodules.							
	9		cl						
560	10								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 3 of 22 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 white, mottled, moist, stiff to very stiff CLAY, trace Silt, trace reddish brown nodules.	cl						
	12	NA: No sample collected for lithologic description.							
	13		NA						
	14	cl: Yellowish orange to light brown, wet, soft, laminated CLAY, weathered Shale texture.							
555	15		cl						
	16	NA: No sample collected for lithologic description.							
	17								
	18		NA						
	19	cl: Yellowish orange to light brown, wet, very soft, laminated CLAY, little gray, angular, chert Gravel, little fine to medium quartz Sand.							
550	20		cl						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 4 of 22 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	21	NA: No sample collected for lithologic description.							
	22		NA						
	23								
	24	ls: LIMESTONE, moderately hard, slightly weathered, intensely fractured, unknown bedding, microcrystalline, medium gray.	ls						
545		cl: Yellowish orange, wet CLAY, some limestone Gravel.	cl						
	25	ls: LIMESTONE, gray, hard.							
	26								
	27		ls						
	28								
	29								
540	30	ls: LIMESTONE, dark gray, hard, slightly weathered, slightly contorted calcite veins, microcrystalline. Little light brown Clay, slightly fractured.							

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 5 of 22 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	ls: LIMESTONE, dark gray, moderately hard, slightly weathered, calcite veins and calcite-filled fractures, moderately fractured.	ls						
	32								
	33		ls						
	34								
535	35								
	36	ls: LIMESTONE, dark gray, moderately hard, slightly weathered, some contorted calcite veins, moderately fractured.							
	37								
	38		ls						
	39								
530	40								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 6 of 22 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	ls: LIMESTONE, dark gray, moderately hard, slightly weathered, some contorted calcite veins and calcite-infilled fractures, moderately fractured.	ls						
	42								
	43								
	44								
525	45								
	46	ls: LIMESTONE, dark gray, moderately hard, slightly weathered, some contorted calcite veins, moderately fractured.							
	47								
	48		ls						
	49								
520	50								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 7 of 22 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	51	ls: LIMESTONE, dark gray, moderately hard, slightly weathered, few calcite veins, microcrystalline.							
	52		ls						
	53								
	54								
515	55	sh: SHALE, black, moderately hard, moderately weathered, few calcite veins in fractures, fissile, moderately fractured.	sh						
	56	ls-sh: Interbedded LIMESTONE and SHALE. Limestone is dark gray, moderately hard, slightly weathered, few calcite veins, microcrystalline. Shale is black, moderately hard, moderately weathered, few calcite veins in fractures, fissile.	ls-sh						
	57	sh: SHALE, black, moderately hard, moderately weathered, few calcite veins in fractures, fissile.	sh						
	58	ls: LIMESTONE, dark gray, moderately hard, slightly weathered, few calcite veins, microcrystalline, little Shale.	ls sh						
	59	sh: SHALE, black, moderately hard, moderately weathered, few calcite veins in fractures, fissile.							
510	60	ls: LIMESTONE, dark gray, moderately hard, slightly weathered, few calcite veins, microcrystalline, little Shale.	ls						
		sh: SHALE, black, moderately hard,							

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 8 of 22 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	61	moderately weathered, few calcite veins in fractures, fissile.	sh						
		ls-sh: Interbedded LIMESTONE and SHALE. Limestone is dark gray, moderately hard, moderately weathered, few calcite veins. Shale is thin to medium bedded.							
	62								
			ls-sh						
	63								
	64								
		sh: SHALE, black, fissile, moderately hard, moderately weathered, microcrystalline.							
505			sh						
	65								
		ls-sh: Interbedded LIMESTONE and SHALE. Limestone is dark gray, moderately hard, moderately weathered, few calcite veins. Shale is thin to medium bedded.	ls-sh						
		sh: SHALE, black, fissile, moderately hard, moderately weathered, microcrystalline.	sh						
	66								
		ls: LIMESTONE, dark gray, moderately hard, moderately weathered, few contorted calcite veins, microcrystalline, moderately fractured.							
	67								
	68								
			ls						
	69								
500									
	70								
	71								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 9 of 22 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	71	NA: No recovery.	NA						
	72	ls-sh: Interbedded LIMESTONE and SHALE. Limestone is dark gray, moderately hard, moderately weathered, few calcite veins. Shale is black, thinly bedded, moderately fractured.	ls-sh						
	73								
	74								
495	75								
	76								
	77	ls-sh: Interbedded LIMESTONE and SHALE. Limestone is dark gray, moderately hard, moderately weathered, few calcite veins. Shale is black, thinly bedded, moderately fractured.	ls-sh						
	78								
	79								
490	80								
	81								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 10 of 22 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	82	ls-sh: Interbedded LIMESTONE and SHALE. Limestone is dark gray, moderately hard, moderately weathered, few calcite veins. Shale is black, thinly bedded, moderately fractured.	ls-sh						
	83								
	84								
485	85								
	86	ls-sh: Interbedded LIMESTONE and SHALE. Limestone is dark gray, moderately hard, moderately weathered, few calcite veins. Shale is black, thinly bedded, moderately fractured.							
	87								
	88		ls-sh						
	89								
480	90								
	91	ls: LIMESTONE, dark gray, moderately hard,							

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 11 of 22 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)
		moderately weathered, few contorted calcite veins, little Shale banding at 93.6' bgs, few							
	92								92
	93		ls						93
	94								94
475	95								95
	96	ls: LIMESTONE, dark gray, moderately hard, moderately weathered, some contorted calcite veins, microcrystalline, little Shale in parted beds, few fractures.							96
	97								97
	98		ls						98
	99								99
470	100								100
	101	ls: LIMESTONE, dark gray, moderately hard, moderately weathered, some contorted calcite veins, microcrystalline, little Shale in parted							101

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 12 of 22 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)
		beds, few fractures.							
	102		ls						102
	103								103
		ls: LIMESTONE, hard, slightly fractured.			Organic Vapor = 0.0ppm				Description from air rotary drill cuttings (103.5-104.8' bgs)
	104		ls						HP 1000psi Water used: 0 gals 104
465									PQ Coring - Miller Drilling Company - 6/11/03
		NA: No recovery.						CD 104.8'	Run 1 (104.8-109.8' bgs)
	105								Ran 5.0' Rec 0.2' Loss 4.8' UL 3.8' Water used: 500 gal, rec 100%, gray HP 350psi WP 50psi Time 5 min 105
	106								106
			NA						
	107								107
	108								108
		ls: LIMESTONE, hard, unweathered, microcrystalline, thinly bedded, highly fractured, fossiliferous, grayish black.	ls		Organic Vapor = 0.0ppm	Box 1 of 11 (108.6 to 119.3' bgs)		CD 108.8'	
	109								109
		ls: LIMESTONE, moderately hard, slightly weathered, calcite in veins, microcrystalline, thin to medium bedding, fossiliferous (possibly brachiopods), grayish black.	ls		Organic Vapor = 0.0ppm				
460									8" steel casing set at 110' bgs
	110	ls: LIMESTONE, moderately hard, slightly weathered, calcite in veins, microcrystalline, thin to medium bedding, 1 natural joint at 113.4' (~45 degrees) with slickensides, fossiliferous (possibly brachiopods), grayish black.							Run 2 (109.8-110.8' bgs) Ran 1.0' Rec 0.8' Loss 0.2' UL NA Water used: 500 gal, rec 40%, gray HP 750psi WP 60psi RQD 100% Time 18 min 110
	111				Organic Vapor = 0.0ppm				Run 3 (110.8-114.8' bgs) Ran 4.0' Rec 4.2' Gain 0.2' UL 1.0' Water used: 250 gal, rec 111

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 13 of 22 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)
									100% HP 750psi WP 80psi RQD 100% Time 9 min
	112		ls						
	113								
	114	NA: No recovery.	NA						
455	115	ls: LIMESTONE, hard, unweathered, moderately fractured. Fractures at 115.6 and 118.5' (~10 degrees) and 117.6' (~30 degrees). Thinly bedded at 45 degrees, contorted, calcite infilled fractures at 90 degrees throughout, fossiliferous, microcrystalline, grayish black.			Organic Vapor = 0.0ppm			CD 114.8'	Run 4 (114.8-119.8' bgs) Ran 5.0' Rec 4.2' Loss 0.8' UL 0.3' Water used: 564 gal, rec 92%, brown to gray HP 800-900psi WP 40-80psi RQD 72% Time 22 min NOTE: Downhole camera noted possible void from 114.8-115.4' bgs
	116								
	117		ls						
	118								
	119	NA: No recovery.	NA						
450	120	ls: LIMESTONE, moderately hard, unweathered, microcrystalline to fine grained, highly to moderately fractured. Fractures at 120.3' (~0 degrees), 121.6' (~30 degrees), and 122.3' (~10 degrees), 121.8' and 123.4' (~70 degreees, calcite infilled fractures). Fracture zone from 124.1-124.6' with shaley limestone. Fossiliferous (shells, crinoids), thin contorted bedding at ~45 degrees, grayish black to black.			Organic Vapor = 0.0ppm	Box 2 of 11 (119.3 to 129.6' bgs)		CD 119.3'	Run 5 (119.8-124.6' bgs) Ran 4.8' Rec 5.0' Gain 0.2' UL 0.6' Water used: 413 gal, rec 73%, gray HP 500psi WP 40psi RQD 64.3% Time 30 min
	121								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 14 of 22 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	122		ls						
	123								
	124								
445	125	ls: LIMESTONE, hard, unweathered, slightly fractured to moderately fractured. Fractures at 124.9' and 125.5' (~30 degrees). Fine grained to microcrystalline, fossiliferous, thinly bedded, stylolites, grayish black.			Organic Vapor = 0.0ppm			CD 124.9'	Run 6 (124.6-129.8' bgs) Ran 5.2' Rec 5.3' Gain 0.1' UL 0.0' Water used: 312 gal, rec 61%, gray HP 1000psi WP 50psi RQD 91.4% Time 19 min NOTE: UL from Run 5 was recovered in Run 6. Core most likely stuck in drill bit, giving erroneous CD.
	126								
	127		ls						
	128								
	129								
440	130	ls: LIMESTONE, moderately hard, unweathered, microcrystalline to fine grained, thinly bedded, stylolites at ~45 degrees, calcite veins (~60 degrees) throughout, offset at 132.5'. Highly to moderately fractured at 129.9', 131.2', and 134.4' (~45 degrees); 130.7' and 131.5' (~90 degrees). Calcite infilled fractures, fossiliferous, dark gray.			Organic Vapor = 0.0ppm	Box 3 of 11 (129.6 to 139.9' bgs)		CD 129.6'	Run 7 (129.8-134.8' bgs) Ran 5.0' Rec 5.1' Gain 0.1' UL 0.2' Water used: 314 gal, rec >100%, brown to gray HP 950psi WP 40psi RQD 75.4% Time 21 min
	131								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 15 of 22 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	132		ls						
	133								
	134								
435		NA: No recovery.	NA						
	135	ls: LIMESTONE, moderately hard, unweathered, microcrystalline to fine grained, thinly bedded, stylolites at ~45 degrees, calcite veins (~60 degrees) throughout. Fractured at 139.6' (~90 degrees). Calcite infilled fractures, fossiliferous, dark gray.			Organic Vapor = 0.0ppm			CD 134.9'	Run 8 (134.8-139.8' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 302 gal, rec >100%, gray HP 900psi WP 40psi RQD 94% Time 19 min
	136								
	137		ls						
	138								
	139								
430									
	140	ls: LIMESTONE, moderately hard, unweathered, microcrystalline to fine grained, thinly bedded, stylolites at ~45 degrees, calcite veins (~60 degrees) throughout, moderately fractured. Fractured at 140.1 (~90 degrees), 142.3' (~40 degrees), and 142.4' (~45 degrees). Calcite infilled fractures, fossiliferous (crinoids), dark gray.			Organic Vapor = 0.0ppm	Box 4 of 11 (139.9 to 149.5' bgs)		CD 139.9'	Run 9 (139.8-144.8' bgs) Ran 5.0' Rec 4.3' Loss 0.7' UL 0.9' Water used: 278 gal, rec >100%, gray HP 900psi WP 40psi RQD 71.1% Time 20 min
	141		ls						
	142								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 16 of 22 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)
	143	ls: LIMESTONE, moderately hard, unweathered, microcrystalline, fossiliferous (shells), grayish black. Moderately fractured at 140.1' and 144.1' (~90 degrees) and 142.4' (~45 degrees).	ls						
	144								
		NA: No recovery.	NA						
425	145								Run 10 (144.8-149.5' bgs) Ran 4.7' Rec 4.4' Loss 0.3' UL 0.0' Water used: 319 gal, rec 98%, gray HP 900psi WP 50psi RQD 100% Time 15 min
		ls: LIMESTONE, moderately hard, unweathered, microcrystalline, fossiliferous (shells), grayish black. Moderately fractured at 146.6' (~90 degrees, brachiopod fossil in fracture), 146.2' (~45 degrees with slickensides), 148.5' (~10 degrees), and 149.5' (~45 degrees).			Organic Vapor = 0.0ppm			CD 145.1'	
	146								
	147		ls						
	148								
	149								
420		ls: LIMESTONE, moderately hard, unweathered, microcrystalline, fossiliferous (shells), grayish black.	ls		Organic Vapor = 0.0ppm	Box 5 of 11 (149.5 to 159.9' bgs)		CD 149.5'	Run 11 (149.5-149.9' bgs) Ran 0.4' Rec 0.4' Loss 0.0' UL 0.0'
	150	ls: LIMESTONE, moderately hard, unweathered, fine to medium grained, thinly bedded with stylolites at ~45 degrees, moderately fractured. Fractures at 152.5' (uneven with striated surface - possibly slickensides, calcite) and 153.5' (~60 degrees with calcite). Fossiliferous (crinoids), medium gray to dark gray.			Organic Vapor = 0.0ppm			CD 149.9'	Water used: 69 gal, rec >100%, gray Time 4 min Run 12 (149.9-154.9' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 371 gals, rec >100%, gray HP 900psi WP 40psi RQD 100% Time 20 min
	151								
	152								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 17 of 22 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)
	153		ls						
	154								
415	155	ls: LIMESTONE, moderately hard, unweathered, fine to medium grained, thinly bedded with stylolites at ~45 degrees, slightly fractured. Fracture at 158.9' (~45 degrees). Fossiliferous (crinoids), medium gray to dark gray.			Organic Vapor = 0.0ppm			CD 154.9'	Run 13 (154.9-159.9' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 323 gals, rec >100%, gray HP 900psi WP 40psi RQD 100% Time 18 min
	156								
	157		ls						
	158								
	159								
410	160	ls: LIMESTONE, moderately hard, unweathered, fine to medium grained, thinly bedded with stylolites at ~45 degrees, highly fractured. Fractures at 160.2' (~90 degrees), 160.7' (~60 degrees, with slickensides and calcite), 161.2', 153.6', and 154.5' (~45 degrees). Fossiliferous (crinoids), medium gray to dark gray.			Organic Vapor = 0.0ppm	Box 6 of 11 (159.9 to 169' bgs)		CD 159.9'	Run 14 (159.9-164.9' bgs) Ran 5.0' Rec 5.4' Gain 0.4' UL 0.0' Water used: 278 gals, rec >100%, gray HP 900psi WP 40psi RQD 74% Time 20 min
	161								
	162								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 18 of 22 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)
	163		ls						
	164								
405	165	ls: LIMESTONE, moderately hard, unweathered, fine to medium grained, thinly bedded with stylolites at ~45 degrees, slightly fractured. Fracture at 169.4' (~60 degrees, with calcite). Fossiliferous (crinoids), medium gray to dark gray.			Organic Vapor = 0.0ppm			CD 164.9'	Run 15 (164.9-169.9' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 351 gals, rec >100%, gray HP 1000psi WP 40psi RQD 100% Time 19 min
	166								
	167		ls						
	168								
	169								
400	170	ls: LIMESTONE, hard, unweathered, microcrystalline to fine grained, thinly bedded, stylolites, moderately fractured. Fractures at 170.3' (~10 degrees), 172.5' and 175.0' (~45 degrees), dark gray.			Organic Vapor = 0.0ppm	Box 7 of 11 (169 to 178.2' bgs)		CD 169.9'	Run 16 (169.9-174.9' bgs) Ran 5.0' Rec 5.2' Gain 0.2' UL 0.0' Water used: 330 gals, rec 93%, gray HP 950psi WP 40psi RQD 88% Time 17 min
	171								
	172								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 19 of 22 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)
	173		ls						
	174								
395	175								Run 17 (174.9-179.9' bgs) Ran 5.0' Rec 5.1' Gain 0.1' UL 0.0' Water used: 314 gals, rec 85%, gray HP 950psi WP 40psi RQD 57% Time 27 min
		ls: LIMESTONE, hard, unweathered, microcrystalline to fine grained, thinly bedded, stylolites, moderately to highly fractured. Fractures at 177.7' (~30 degrees), 178.2' and 178.6' (~20 degrees), 179.2' (~10 degrees), 179.6' (~45 degrees), and 179.7' (~60 degrees, with slickensides). Dark gray.			Organic Vapor = 0.0ppm			CD 175.1'	
	176								
	177								
	178		ls			Box 8 of 11 (178.2 to 188.2' bgs)			
	179								
390	180								Run 18 (179.9-184.9' bgs) Ran 5.0' Rec 4.7' Loss 0.3' UL 0.0' Water used: 356 gal, rec 99%, gray HP 950psi WP 40psi RQD 97.8% Time 16 min
		ls: LIMESTONE, hard, unweathered, microcrystalline to fine grained, thinly bedded, stylolites, moderately to highly fractured. Fractures at 180.2' (~45 degrees), 180.4' and 180.5' (~10 degrees). Dark gray.			Organic Vapor = 0.0ppm			CD 180.0'	
	181								
	182		ls						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 20 of 22 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)
	183								
	184								
385	185	ls: LIMESTONE, hard, unweathered, microcrystalline to fine grained, thinly bedded, stylolites, dark gray.	ls		Organic Vapor = 0.0ppm			CD 184.7'	Run 19 (184.9-189.9' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.1' Water used: 344 gal, rec 86%, gray HP 900psi WP 40psi RQD 100% Time 18 min
	186								
	187								
	188					Box 9 of 11 (188.2 to 197.1' bgs)			
	189								
380	190	NA: No recovery. ls: LIMESTONE, hard, unweathered, microcrystalline to fine grained, thinly bedded, contorted, stylolites, moderately fractured. Fractures at 190.0' and 192.5' (~90 degrees), 191.2' (~20 degrees, with smooth calcite), and 194.1' (~30 degrees). Medium gray to dark gray, hairline fractures throughout.	NA ls		Organic Vapor = 0.0ppm			CD 189.8'	Run 20 (189.9-194.9' bgs) Ran 5.0' Rec 5.2' Gain 0.2' UL 0.0' Water used: 539 gal, rec 97%, gray HP 900psi WP 50psi RQD 96.1% Time 34 min
	191								
	192								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 21 of 22 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)
375	193								193
	194								194
	195	ls: LIMESTONE, hard, unweathered, microcrystalline to fine grained, thinly bedded, contorted, stylolites, moderately fractured. Fractures at 196.0', 196.4', and 198.7' (~90 degrees), 197.5' (~45 degrees). Medium gray to dark gray, hairline fractures throughout.	ls		Organic Vapor = 0.0ppm	Box 10 of 11 (197.1 to 206.0' bgs)		CD 195.0'	Run 21 (194.9-199.9' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 441 gal, rec 83%, gray HP 900psi WP 50psi RQD 94% Time 29 min
	196								196
	197								197
	198								198
	199								199
370	200	ls: LIMESTONE, hard, unweathered, microcrystalline to fine grained, thinly bedded, contorted, stylolites, moderately fractured. Fractures at 200.2' and 203.6' (~90 degrees), 201.0' and 204.7' (~45 degrees), 202.6' and 204.4' (~30 degrees). Medium gray to dark gray, hairline fractures throughout.	ls		Organic Vapor = 0.0ppm			CD 200.0'	Run 22 (199.9-104.9' bgs) Ran 5.0' Rec 5.3' Gain 0.3' UL 0.0' Water used: 431 gal, rec >100%, gray HP 950psi WP 50psi RQD 83.6% Time 26 min
	201								201
	202								202

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW22

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 22 of 22 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)
365	203								
	204								
	205	ls: LIMESTONE, hard, unweathered, microcrystalline to fine grained, thinly bedded, contorted, stylolites, moderately fractured. Fracture system at 205.7 'and 209.7' (~45 degrees), 208.0 (~90 degrees, contorted). Medium gray to dark gray, hairline fractures throughout.	ls		Organic Vapor = 0.0ppm	Box 11 of 11 (206.0 to 209.9' bgs)		CD 204.9'	Run 23 (204.9-209.9' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 431 gal, rec 96%, gray HP 950psi WP 50psi RQD 90% Time 24 min
	206								
	207								
	208								
	209								Air rotary - Miller Drilling Company - 8/13/03 Air rotary overdrill to 210' bgs
360	210	NA: No sample collected for lithologic description.	NA					CD 209.9'	Bottom of borehole at 210' bgs

HTRW DRILLING LOG

District: **Mobile USACE**

HOLE NUMBER RNG-203-MW23

1. Company name: **Shaw Environmental, Inc.**

2. Drill Subcontractor: Miller Drilling Company

Sheet 1 of 25 sheets

3. Project: Fort McClellan

4. Location: **Calhoun County, Alabama**

5. Name of driller: Glen Bilbrey/Mike Martin/Stephen Keener

6. Mfr. designation of drill: CME-750X/Ingersoll Rand T3W

7. Sizes and types of drilling and sampling equipment:
Hollow Stem Auger, Air Rotary, Triple PQ Coring
HSA - 5'x4.25" ID Augers, 2'x2" Steel Split Spoons
AR - 12.25" & 7.875" Tri-cone Roller Bits, 5.875" Air Hammer

8. Hole location: Range K, Parcel 203(7)

9. Surface elevation (feet above mean sea level): 576.91

10. Date started: 06/05/03

11. Date completed: 09/08/03

12. Overburden thickness (feet bgs): 33

15. Depth groundwater encountered (feet bgs): 39

13. Depth drilled into rock (feet bgs): 207.4

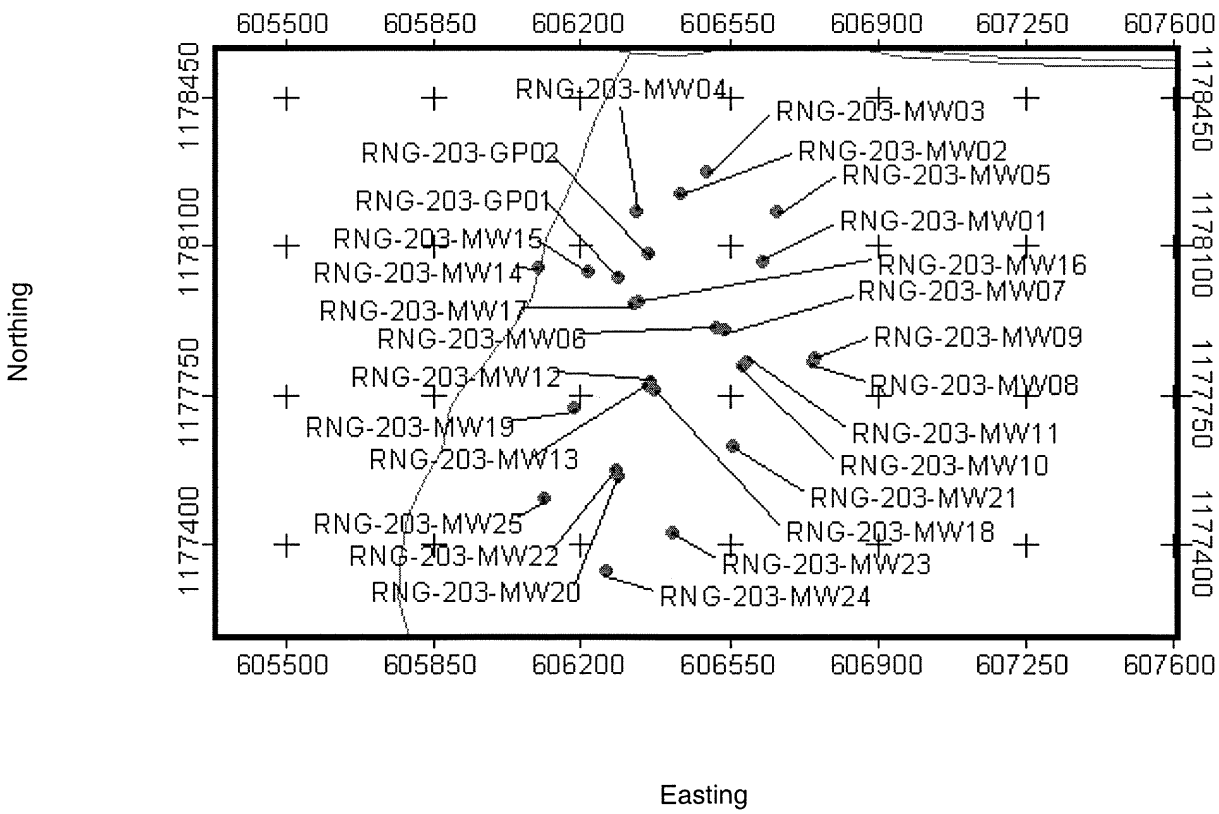
16. Depth to water and elapsed time after drilling completed (feet bgs): 4 on 6/6/03

14. Total depth of hole (feet bgs): 240.4

17. Other water level measurements (specify): NA

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: 21		
	NA	NA	NA			
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
	NA	NA	NA	NA	NA	183.6
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
	NA	2.5" Permanent	NA	Adam Day/Kyle Wilson		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 2 of 25 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: Grayish brown to orangish brown, moist, soft CLAY, trace Sand, little Silt.	cl		Organic Vapor = 0.0ppm			pushed	HSA - Miller Drilling Company - 6/5/03 Rec 1.4'/2.0' (0-2' bgs)
	1								
		NA: No recovery.	NA						
575	2	cl: Yellowish orange to brown, soft, moist CLAY, little Silt.	cl		Organic Vapor = 0.0ppm			1 3 5 6	Rec 1.6'/2.0' (2-4' bgs)
	3								
		NA: No recovery.	NA						
	4	cl: Yellowish orange to brown, soft, moist CLAY, little Silt.	cl		Organic Vapor = 0.0ppm			3 7 8 10	Rec 0.2'/2.0' (4-6' bgs)
		NA: No recovery.	NA						
	5								
	6	cl: Reddish orange to yellowish orange, mottled, stiff, dry CLAY, trace Sand, trace Silt, trace gray, angular, fine grained, soft sandstone Gravel.	cl		Organic Vapor = 0.0ppm			4 7 9 13	Rec 2.0'/2.0' (6-8' bgs)
570	7								
	8	cl: Reddish orange to grayish white to yellowish orange, mottled, stiff, moist CLAY.	cl		Organic Vapor = 0.0ppm			7 8 9 15	Rec 2.0'/2.0' (8-10' bgs)
	9								
	10				Organic			5 6 8 9	Rec 1.8'/2.0' (10-12' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 3 of 25 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: Reddish orange to grayish white to yellowish orange, mottled, stiff, moist CLAY.	cl		Vapor = 0.0ppm				
565	12	NA: No recovery.	NA						
		NA: No sample collected for lithologic description.							
	13		NA						
	14	cl: Reddish orange to grayish white to yellowish orange, mottled, stiff, moist CLAY.			Organic Vapor = 0.0ppm			3 4 4 7	Rec 2.0'/2.0' (14-16' bgs)
	15		cl						
	16	NA: No sample collected for lithologic description.							
560	17								
			NA						
	18								
	19	cl: Reddish orange to light brown, mottled, stiff, dry CLAY, trace Sand, little black mottling from 20-21'.			Organic Vapor = 0.0ppm			3 4 7 8	Rec 2.0'/2.0' (19-21' bgs)
	20		cl						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 4 of 25 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	21	NA: No sample collected for lithologic description.							
555	22		NA						
	23								
	24	cl: Reddish brown to light brown to black, mottled, stiff, moist, highly plastic CLAY.			Organic Vapor = 0.0ppm			3 3 4 6	Rec 2.0'/2.0' (24-26' bgs)
	25		cl						
	26	NA: No sample collected for lithologic description.							
550	27		NA						
	28								
	29	cl: Reddish brown to light brown to black, mottled, stiff, moist, highly plastic CLAY.			Organic Vapor = 0.0ppm			3 3 5 8	Rec 2.0'/2.0' (29-31' bgs)
	30		cl						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 5 of 25 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	31	NA: No sample collected for lithologic description.							
545	32		NA						
	33	ls: LIMESTONE, hard, no noticeable fractures.			Organic Vapor = 0.0ppm				HSA refusal encountered at 44.5' bgs. Offset boring and drilled with air rotary (6/11/03), competent bedrock encountered at 33' bgs. HP 500psi Water used: 90 gals, rec 100%
	34								
	35		ls						
	36								
540	37								
	38	ls: LIMESTONE, hard, unweathered, fine grained, thinly bedded, stylolites at 30 degrees, highly to moderately fractured. Fractures at 39.6' (~10 degrees) and 40.2' (~30 degrees, with slickensides and large fossil fragments), fossiliferous (crinoids, possible shells), medium gray.			Organic Vapor = 0.0ppm	Box 1 of 21 (38.1 to 48.1' bgs)		CD 38.1'	8" steel casing set at 38' bgs PQ Coring - Miller Drilling Company - 9/8/03 Run 1 (38.1-41.2' bgs) Ran 3.1' Rec 2.8' Loss 0.3' UL 0.0' Water used: 227 gal, rec 79%, brownish gray HP 900-950psi WP 50psi RQD 100% Time 11 min Groundwater encountered at 39' bgs
	39		ls						
	40								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 6 of 25 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)
535	41	ls: LIMESTONE, hard, unweathered, fine to medium grained, intact, fossiliferous, thinly bedded, contorted, medium gray.	ls		Organic Vapor = 0.0ppm			CD 40.9'	Run 2 (41.2-46.2' bgs) Ran 5.0' Rec 4.8' Loss 0.2' UL 0.4' Water used: 307 gal, rec 100%, gray to light gray HP 900psi WP 100psi RQD 100% Time 20 min
	42								
	43								
	44								
	45								
	46	NA: VOID, some orange Clay.	NA						
530	47	ls: LIMESTONE, hard, unweathered, fine to medium grained, intact, fossiliferous, thinly bedded, contorted, medium gray.	ls		Organic Vapor = 0.0ppm	Box 2 of 21 (48.1 to 57.2' bgs)		CD 46.1'	Run 3 (46.2-51.2' bgs) Ran 5.0' Rec 5.1' Gain 0.1' UL 0.0' Water used: 281 gal, rec >100%, whitish gray HP 900psi WP 50psi RQD 100% Time 19 min
	48								
	49								
	50								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 7 of 25 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	51								
525	52	ls: LIMESTONE, hard, unweathered, microcrystalline to medium grained, banded, stylolites at ~30 degrees, fossiliferous (crinoids), moderately to slightly fractured. Fractures at 54.5' and 55.3' (~30 degrees). Medium gray to black.	ls		Organic Vapor = 0.0ppm			CD 51.2'	Run 4 (51.2-56.2' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 243 gals, rec >100%, whitish gray HP 900psi WP 50psi RQD 100% Time 16 min
	53								
	54								
	55								
	56								
520	57	ls: LIMESTONE, hard, unweathered, microcrystalline to medium grained, banded, stylolites at ~30 degrees, fossiliferous (crinoids), moderately fractured to slightly fractured. Fractures at 59.4' and 61.7' (~30 degrees), clay in fractures, possible slickensides. Medium gray to black.	ls		Organic Vapor = 0.0ppm	Box 3 of 21 (57.2' to 66.2' bgs)		CD 56.2'	Run 5 (56.2-61.2' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 310 gal, rec 98%, whitish gray HP 900psi WP 50psi RQD 100% Time 21 min
	58								
	59								
	60								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 8 of 25 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	61								61
		ls: LIMESTONE, hard, slightly weathered, fine grained to microcrystalline, slightly to highly fractured. Fracture at 63.8' (20 degrees, iron stained). Banded, contorted beds, medium gray.			Organic Vapor = 0.0ppm			CD 61.2'	Run 6 (61.2-66.2' bgs) Ran 5.0' Rec 4.7' Loss 0.3' UL 0.3' Water used: 303 gals, rec 91%, gray to brown HP 950psi WP 50psi RQD 88% Time 16 min
515	62		ls						62
	63								63
	64	NA: VOID, some brown Clay.	NA						64
		ls: LIMESTONE, hard, slightly weathered, fine grained to microcrystalline, slightly to highly fractured. Fractures at 64.5' (~30 degrees across bedding, iron stained) and 70.3' (~30 degrees, iron stained). Banded, contorted beds, medium gray.							
	65		ls						65
	66								66
		ls: LIMESTONE, hard, unweathered, fine to medium grained, fossiliferous (crinoids, shells), slightly fractured. Clay-filled fracture at 68.6'. Contorted, banded, medium gray.			Organic Vapor = 0.0ppm	Box 4 of 21 (66.2' to 75.4' bgs)		CD 66.2'	Run 7 (66.2-71.2' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 340 gal, rec >100%, brown HP 900psi WP 40psi RQD 100% Time 17 min
510	67								67
	68								68
			ls						
	69								69
	70								70
	71								71

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 9 of 25 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)
505	72	ls: LIMESTONE, hard, unweathered, fine to medium grained, fossiliferous (crinoids, shells), slightly fractured. Fracture at 75.3' (~30 degrees). Contorted, banded, medium gray.	ls		Organic Vapor = 0.0ppm	Box 5 of 21 (75.4' to 88.3' bgs)		CD 71.2'	Run 8 (71.2-76.2' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 290 gal, rec >100%, whitish gray HP 900psi WP 40psi RQD 100% Time 18 min
	73								
	74								
	75								
	76								
500	77	ls: LIMESTONE, hard, unweathered, fine to medium grained, fossiliferous (crinoids, shells), slightly fractured. Contorted, banded, medium gray.	ls		Organic Vapor = 0.0ppm			CD 76.2'	Run 9 (76.2-81.2' bgs) Ran 5.0' Rec 3.1' Loss 1.9' UL 0.4' Water used: 254 gal, rec >100%, brown to whitish gray HP 900psi WP 40psi RQD 80% Time 15 min
	78								
	79	NA: VOID, some brown Clay.	NA						
	80	ls: LIMESTONE, hard, unweathered, fine to medium grained, fossiliferous (crinoids, shells), slightly fractured. Contorted, banded, medium gray. NA: VOID, some brown Clay.	ls NA					CD 79.7'	
	81								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 10 of 25 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)
495	82	ls: LIMESTONE, hard, unweathered, fine to medium grained, fossiliferous (crinoids, shells), slightly fractured. Contorted, banded, medium gray.	ls		Organic Vapor = 0.0ppm				Run 10 (81.2-86.2' bgs) Ran 5.0' Rec 3.4' Loss 1.6' UL 3.1' Water used: 318 gal, rec 92%, brown HP 900psi WP 40psi RQD 68% Time 15 min
	83								
	84	NA: VOID, some brown Clay, some fine quartz Sand.	NA						
	85	ls: LIMESTONE, hard, unweathered, fine to medium grained, fossiliferous (crinoids, shells), slightly fractured. Contorted, banded, medium gray.	ls						
	86	NA: VOID, some brown Clay, some fine quartz Sand.	NA						
490	87	ls: LIMESTONE, hard, unweathered, fine to medium grained, fossiliferous (crinoids, shells), slightly fractured. Contorted, banded, medium gray.	ls		Organic Vapor = 0.0ppm			CD 86.2'	Run 11(86.2-91.2' bgs) Ran 5.0' Rec 2.1' Loss 2.9' UL 2.9' Water used: 345 gal, rec 90%, brown HP 500psi WP 40psi RQD 26% Time 15 min
		NA: VOID, some brown Clay, some fine Sand.	NA						
		NA: No recovery.	NA						
		NA: VOID, some brown Clay, some fine Sand.							
	88	ls: LIMESTONE, hard, unweathered, fine to medium grained, fossiliferous (crinoids, shells), slightly fractured. Contorted, banded, medium gray.	ls			Box 6 of 21 (88.3 to 99.5' bgs)			
	89	NA: VOID, some brown Clay, some fine Sand.	NA						
	90								
	91	ls: LIMESTONE, hard, highly weathered, iron stained fractures, banded and contorted bedding giving mottled appearance, fine grained, fossiliferous, black to dark gray.	ls		Organic			CD	Run 12 (91.2-96.2' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 11 of 25 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)
485	92	ls: LIMESTONE, hard, moderately weathered, iron stained fractures, banded and contorted bedding at ~30 degrees with shaley gray limestone (<1mm) in bedding planes, fossiliferous (crinoids), medium gray to grayish black, slightly mottled appearance, fine grained to microcrystalline, moderately fractured. Fractures at 91.7' (~45 degrees,	ls		Vapor = 0.0ppm			91.2'	Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 579 gal, rec >100%, brown to light brown HP 900psi WP 40psi RQD 90% Time 30 min
	93								
	94								
	95								
	96								
480	97	ls: LIMESTONE, hard, moderately weathered, banded and contorted bedding, intensely to highly fractured. Fractures at 97.3' and 99.6' (~30 degrees), 98.8' (~45 degrees), intensely fractured from 99.6-100.7', iron stained fractures. Microcrystalline to medium grained, fossiliferous (crinoids), medium gray to black to light brown, mottled.			Organic Vapor = 0.0ppm			CD 96.2'	Run 13 (96.2-101.1' bgs) Ran 4.9' Rec 5.2' Gain 0.3' UL 0.0' Water used: 850 gal, rec >100%, light brown HP 900psi WP 40-50psi RQD 75.5% Time 59 min
	98								
	99		ls						
	100					Box 7 of 21 (99.5 to 116.5' bgs)			
	101				Organic Vapor = 0.0ppm			CD 100.7'	Run 14 (101.1-106.2' bgs) Ran 5.1' Rec 2.4'

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 12 of 25 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)
475	102	ls: LIMESTONE, hard, moderately weathered, banded and contorted bedding, intensely fractured, iron stained fractures. Microcrystalline to medium grained, fossiliferous (crinoids), medium gray to black to light brown, mottled.	ls						Loss 2.7' UL 0.2' Water used: 472 gal, rec 76%, brown HP 1000psi WP 60psi RQD 18% Time 33 min NOTE: Remainder of UL was recovered in Run 13
	103	NA: No recovery.	NA						
	104	NA: VOID.						CD 104.0'	
	105		NA						
	106								
470	107	ls: LIMESTONE, hard, moderately weathered, banded and contorted bedding, intensely fractured, iron stained fractures. Microcrystalline to medium grained, fossiliferous (crinoids), medium gray to black to light brown, mottled.	ls		Organic Vapor = 0.0ppm				Run 15 (106.2-111.2' bgs) Ran 5.0' Rec 0.2' Loss 4.8' UL 6.8' Water used: 243 gals, rec >100%, whitish gray HP 900psi WP 40psi RQD NA Time 1 min
	108	NA: VOID.							
	109		NA						
	110								
	111	NA: VOID.	NA		Organic Vapor = 0.0ppm			CD 111.0'	Run 16 (111.2-116.2' bgs) Ran 5.0' Rec 2.5' Loss 2.5' UL 1.2'
		ls: LIMESTONE, moderately hard to hard, moderately weathered, microcrystalline to							

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 13 of 25 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)
465	112	medium grained, banded, stylolitic beds at ~45 degrees, intensely to moderately fractured. Fossiliferous (crinoids), medium gray to dark gray.	ls						Water used: 420 gal, rec 50%, brown HP 900psi WP 40psi RQD 37% Time 20 min
		NA: VOID.	NA						
	113	ls: LIMESTONE, moderately hard to hard, moderately weathered, microcrystalline to medium grained, banded, stylolitic beds at ~45 degrees, intensely to moderately fractured. Fossiliferous (crinoids), 0.1' vug at 113.5', medium gray to dark gray.	ls						
	114	NA: VOID.	NA						
		NA: VOID.	NA					CD 114.7'	
	115								
	116	ls: LIMESTONE, moderately hard to hard, moderately weathered, microcrystalline to medium grained, banded, stylolitic beds at ~45 degrees, intensely to moderately fractured. Fossiliferous (crinoids), medium gray to dark gray.	ls		Organic Vapor = 0.0ppm				
460	117	ls: LIMESTONE, hard to moderately hard, microcrystalline to medium grained, unweathered, banded and contorted bedding, stylolites at ~45 degrees, slightly fractured. Fracture at 116.5' (90 degrees). Fossiliferous (crinoids), medium bluish gray.			Organic Vapor = 0.0ppm	Box 8 of 21 (116.5 to 126.2' bgs)			Run 17 (116.2-121.2' bgs) Ran 5.0' Rec 5.2' Gain 0.2' UL NA Water used: 495 gal, rec 58%, brown HP 1000psi WP 40psi RQD 98% Time 19 min
	118								
			ls						
	119								
	120								6" steel casing set at 120' bgs
	121								
		ls: LIMESTONE, moderately hard, unweathered, fine to medium grained, banded at ~45 degrees, medium light gray. Fracture at 121.8' (~20 degrees, slight iron staining).							Run 18 (121.2-126.2' bgs) Ran 5.0' Rec 4.7' Loss 0.3' UL NA HP 850psi WP 50psi

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 14 of 25 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)
455	122	Fossiliferous.							Water used: 560 gal, rec 100% RQD 78% Time 25 min
	123		ls						
	124								
	125								
	126								
		ls: LIMESTONE, hard, crystalline, light gray.	ls		Organic Vapor = 0.0ppm	Box 9 of 21 (126.2 to 136.1' bgs)			Run 19 (126.2-126.7' bgs) Ran 0.5' Rec 0.3' Loss 0.2' UL NA
		NA: No recovery.	NA						
450	127	ls: LIMESTONE, hard, crystalline, unweathered, light medium gray, black veins of dolomite.	ls					CD 126.7'	Run 20 (126.7-127.2' bgs) Ran 0.5' Rec 0.5' Loss 0.0' UL 0.0' Water lost: 100 gals HP 800psi RQD 100% Time 15 min
		ls: LIMESTONE, massive, crystalline, unweathered, hard, light medium gray, some veins of manganese.			Organic Vapor = 0.0ppm			CD 127.2'	
	128								Run 21 (127.2-131.3' bgs) Ran 4.1' Rec 4.1' Loss 0.0' UL NA Water used: 900 gal, rec 13%, light grayish brown HP 800psi RQD 100%
	129		ls						
	130								
	131								
		ls: LIMESTONE, moderately hard, fine to medium grained, fossiliferous, contorted thin bedding, stylolites, moderately to highly fractured. Fractures at 131.6' (~5 degrees),			Organic Vapor = 0.0ppm				Run 22 (131.3-136.1' bgs) Ran 4.8' Rec 5.0' Gain 0.2' UL NA Water used: 597 gal, rec 4%,
445									

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 15 of 25 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	132	132.2', 134.6', 135.4', and 135.7' (~90 degrees), 134.3' (~55 degrees), 135.0' (~20 degrees). Medium gray.							grayish brown HP 1000psi WP 100psi RQD 58.3% Time 8 min
	133		ls						
	134								
	135								
	136	ls: LIMESTONE, moderately hard, fine to medium grained, fossiliferous, contorted thin bedding, stylolites, moderately to highly fractured. Fractures at 136.8' and 140.2' (~30 degrees), 138.3' (~5 degrees), 139.7' and 140.6' (~90 degrees). Medium gray.			Organic Vapor = 0.0ppm	Box 10 of 21 (136.1 to 145.7' bgs)		CD 136.0'	Run 23 (136.1-141.2' bgs) Ran 5.1' Rec 4.9' Loss 0.2' UL 0.3' Water used: 729 gal, rec 0% HP 1000psi WP 100psi RQD 69.2% Time 9 min
440	137								
	138		ls						
	139								
	140								
	141	NA: No recovery.	NA		Organic Vapor = 0.0ppm			CD 141.2'	Run 24 (141.2-146.2' bgs) Ran 5.0' Rec 5.1' Gain 0.1' UL 0.0' Water used: 850 gal, rec 12%, black to brown HP 1000psi WP 80psi
435	142	ls: LIMESTONE, moderately hard, fine to medium grained, banded and contorted bedding, stylolites, gray shale in beddings planes, fossiliferous (crinoids), mottled with blackish gray limestone, moderately fractured.							

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 16 of 25 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)
		Fractures at 141.4' and 145.7' (~90 degrees), 144.3' (~45 degrees). Medium gray to grayish black.							RQD 100% Time 9 min. NOTE: 0.2' of UL from Run 23 was recovered in Run 24.
	143		ls						
	144								
	145								
	146					Box 11 of 21 (145.7 to 154.4' bgs)			
430	147	ls: LIMESTONE, moderately hard, fine to medium grained, banded and contorted bedding, stylolites, gray shale in beddings planes, fossiliferous (crinoids), mottled with blackish gray limestone, moderately fractured. Fractures at 147.0' (~90 degrees), 147.3' (~60 degrees), 147.7' and 148.9' (~45 degrees), and 150.5' (~10 degrees). Medium gray to grayish black.			Organic Vapor = 0.0ppm			CD 146.1'	Run 25 (146.2-151.2' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 1035 gal, rec <1%, gray HP 950psi WP 90-110psi RQD 86% Time 29 min
	148								
	149		ls						
	150								
	151								
425	152	ls: LIMESTONE, moderately hard, fine grained, bedding banded and contorted at ~45 degrees, offset bedding with gray shale in bedding planes, fossiliferous (crinoids), highly fractured (intensely fractured with offset veins). Fractures with iron staining at 151.4', 152.5', 154.3', and 155.9' (~45 degrees), 151.7 (~90 degrees), 153.4' and 153.9' (~10			Organic Vapor = 0.0ppm			CD 151.1'	Run 26 (151.2-156.2' bgs) Ran 5.0' Rec 4.9' Loss 0.1' UL 0.0" Water used: 665 gal, rec 0% HP 950-1000psi WP 90psi RQD 66% Time 25 min

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 17 of 25 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)
		degrees), 154.0' (~30 degrees). Medium gray to grayish black.	ls						
	153								153
	154					Box 12 of 21 (154.4 to 162.8' bgs)			154
	155								155
	156	ls: LIMESTONE, moderately hard, fine grained, bedding banded and contorted at ~45 degrees, offset bedding with gray shale in bedding planes, fossiliferous (crinoids), highly fractured (intensely fractured with offset veins). Fracture zone at 156.2-156.8' (~45 degrees), 158.5' (~90 degrees), 158.9' and 161.0' (~10 degrees), 159.7' (~10 degrees), 160.1-160.2' (~90 and 0 degrees). Medium gray to grayish black.			Organic Vapor = 0.0ppm			CD 156.0'	156 Run 27 (156.2-161.2' bgs) Ran 5.0' Rec 5.1' Gain 0.1' UL 0.0' Water used: 1168 gal, rec 13%, clear to brown HP 1000psi WP 500-800psi RQD 86% Time 35 min
420	157								157
	158		ls						158
	159								159
	160								160
	161	ls: LIMESTONE, moderately hard, microcrystalline, fossiliferous, thin bedding, slightly fractured. Fractures at 162.7', 164.3', and 165.9' (90 degrees). Medium gray.			Organic Vapor = 0.0ppm			CD 161.1'	161 Run 28 (161.2-166.2' bgs) Ran 5.0' Rec 4.9' Loss 0.1' UL 0.2' Water used: 1300 gal, rec 4%, gray HP 950psi WP 50psi RQD 96% Time 24 min
415	162								162

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 18 of 25 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)
	163		ls			Box 13 of 21 (162.8 to 171.4' bgs)			
	164								
	165								
	166	NA: No recovery.	NA						
		ls: LIMESTONE, moderately hard, microcrystalline, fossiliferous, thin bedding, slightly fractured. Fractures at 168.5' (~90 degrees) and 169.6'. Medium gray.			Organic Vapor = 0.0ppm			CD 166.2'	Run 29 (166.2-171.2' bgs) Ran 5.0' Rec 4.7' Loss 0.3' UL 0.0' Water used: 750 gal, rec 0% HP 950psi WP 100psi RQD 100% Time 25 min
410	167								
	168		ls						
	169								
	170								
	171	ls: LIMESTONE, banded, unweathered, fine to medium grained, contorted beds, offset, fossiliferous (crinoids), moderately hard, medium gray. Fractures at 171.6' (~10 degrees) and 171.9' (~30 degrees).	ls		Organic Vapor = 0.0ppm	Box 14 of 21 (171.4 to 180.8' bgs)		CD 170.9'	Run 30 (171.2-175.8' bgs) Ran 4.6' Rec 4.8' Gain 0.2' UL 0.0' Water used: 720 gal, rec 14%, gray HP 1000psi WP 90psi RQD 54.5% Time 9 min
405	172								
		ls: LIMESTONE, banded, unweathered, fine to							

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 19 of 25 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)
	173	medium grained, contorted beds, offset, fossiliferous (crinoids), moderately hard, medium gray, intensely to highly fractured (possibly due to recovery procedure). Fractures at 172.4' and 175.2' (~10 degrees), 173.0' (~90 degrees), 173.8' (~45 degrees).	ls						
	174								
	175								
	176	ls: LIMESTONE, banded, unweathered, fine to medium grained, contorted beds, offset, fossiliferous (crinoids), moderately hard, medium gray, moderately fractured. Fractures at 176.8' (~90 degrees), 177.5' (~60 degrees), and 178.8' (~10 degrees).			Organic Vapor = 0.0ppm			CD 175.7'	Run 31 (175.8-180.8' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.1' Water used: 1065 gal, rec 14% HP 1000psi WP 100psi RQD 100% Time 9 min
400	177								
	178		ls						
	179								
	180								
		NA: No recovery.	NA		Organic Vapor = 0.0ppm	Box 15 of 21 (180.8 to 190.1' bgs)		CD 180.8'	Run 32 (180.8-185.5' bgs) Ran 4.7' Rec 4.7' Loss 0.0' UL NA Water used: 937 gal, rec 0% HP 1000psi WP 90psi RQD 97.8% Time 14 min
	181	ls: LIMESTONE, hard, slightly weathered, fine grained, moderately fractured. Fractures at 181.7', 182.3' and 182.4' (~90 degrees, iron stained), 184.2' (~90 degrees). Slightly fossiliferous, offset hairline fractures throughout, thin contorted beds, medium dark gray.							
395	182								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 20 of 25 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)
	183		ls						183
	184								184
	185								185
	186	ls: LIMESTONE, hard, slightly weathered, fine grained, moderately fractured. Slightly fossiliferous, offset hairline fractures throughout, thin contorted beds, medium dark gray.			Organic Vapor = 0.0ppm				Run 33 (185.5-190.5' bgs) Ran 5.0' Rec 4.8' Loss 0.2' UL NA Water used: 688 gal, rec 0% HP 1000psi WP 90psi RQD 97.9% Time 14 min 186
390	187								187
	188		ls						188
	189								189
	190								190
	191	ls: LIMESTONE, hard, slightly weathered, fine grained, moderately fractured. Fractures at 190.7' and 193.7' (~45 degrees), 191.4' (~90 degrees),192.1' (~30 degrees). Slightly fossiliferous, offset hairline fractures throughout, thin contorted beds, medium dark gray.			Organic Vapor = 0.0ppm	Box 16 of 21 (190.1 to 200.1' bgs)		CD 190.1'	Run 34 (190.5-195.1' bgs) Ran 4.6' Rec 4.9' Gain 0.3' UL 0.0' Water used: 680 gal, rec 0% HP 1000psi WP 90psi RQD 96.1% Time 14 min 191
385	192		ls						192

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 21 of 25 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)
	193								
	194								
	195	ls: LIMESTONE, hard, unweathered, thin contorted bedding, stylolitic, fossiliferous, moderately to highly fractured. Fractures at 196.1', 197.6', 198.9', and 199.8' (~30 degrees), 198.0' and 198.2' (~10 degrees), 199.1' (~45 degrees). Medium gray to medium dark gray.			Organic Vapor = 0.0ppm			CD 195.0'	Run 35 (195.1-200.1' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.1' Water used: 848 gal, rec 0% HP 1000psi WP 90psi RQD 80% Time 14 min
	196								
380	197		ls						
	198								
	199								
	200	NA: No recovery.	NA		Organic Vapor = 0.0ppm	Box 17 of 21 (200.1 to 210.0' bgs)		CD 200.1'	Run 36 (200.1-205.5' bgs) Ran 5.4' Rec 5.2' Loss 0.2 UL 0.2' Water used: 606 gal, rec 0% HP 1000psi WP 90psi RQD 59% Time 15 min
	201	ls: LIMESTONE, hard, unweathered, thick bedding, contorted, stylolites at ~60 degrees, fine to medium grained, moderately to intensely fractured. Fractures at 200.8' and 202.7' (~10 degrees), 203.3' and 204.8' (~30 degrees); fracture zones from 203.3 - 204.3' and 204.8 - 205.3'. Fossiliferous, medium dark gray.							
375	202								
	203		ls						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 22 of 25 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)
	204								204
	205								205
		NA: No recovery.	NA						
	206	ls: LIMESTONE, hard, unweathered, thick bedding, contorted, stylolites at ~60 degrees, fine to medium grained, moderately to intensely fractured. Fractures at 207.6' and 209.7' (~30 degrees), 208.5' (~15 degrees), 209.5' (~10 degrees), and 210.5'. Fossiliferous, medium dark gray.			Organic Vapor = 0.0ppm			CD 205.5'	Run 37 (205.5-210.5' bgs) Ran 5.0' Rec 5.1' Gain 0.1' UL 0.0' Water used: 531 gal, rec 0% HP 1000psi WP 90psi RQD 96% Time 16 min
370	207								207
	208		ls						208
	209								209
	210					Box 18 of 21 (210.0 to 218.5' bgs)			210
		ls: LIMESTONE, hard, unweathered, thick bedding, contorted, stylolites at ~60 degrees, fine to medium grained, moderately to intensely fractured. Fractures at 212.2' and 212.3' (~90 degrees), 212.5' and 213.9' (~10 degrees). Fossiliferous, medium dark gray.			Organic Vapor = 0.0ppm			CD 210.6'	Run 38 (210.5-215.5' bgs) Ran 5.0' Rec 4.9' Loss 0.1' UL 0.0' Water used: 467 gal, rec 0% HP 1000psi WP 90psi RQD 94% Time 22 min
365	212								212
	213								213

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 23 of 25 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)
	214		ls						214
	215								215
	216	ls: LIMESTONE, hard, unweathered, thick bedding, contorted, stylolites at ~60 degrees, fine to medium grained, moderately to intensely fractured. Fractures at 216.5', 219.1', and 219.6' (~30 degrees), 216.8' (~20 degrees), 217.4' (~10 degrees), 218.4' (~45 degrees). Fossiliferous, medium dark gray.			Organic Vapor = 0.0ppm			CD 215.5'	Run 39 (215.5-220.5' bgs) Ran 5.0' Rec 4.8' Loss 0.2' UL 0.0' Water used: 683 gal, rec 0% HP 1000psi WP 90psi RQD 94% Time 23 min
360	217								217
	218		ls						218
	219					Box 19 of 21 (218.5 to 226.7' bgs)			219
	220								220
	221	ls: LIMESTONE, hard, unweathered, thick bedding, contorted, stylolites at ~60 degrees, fine to medium grained, intensely fractured. Fossiliferous, medium dark gray.			Organic Vapor = 0.0ppm			CD 220.3'	Run 40 (220.5-225.5' bgs) Ran 5.0' Rec 5.1' Gain 0.1' UL 0.0' Water used: 905 gal, rec 0% HP 1000psi WP 70psi RQD 35% Time 18 min
355	222								222
	223		ls						223

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 24 of 25 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)
	224								224
	225								225
		ls: LIMESTONE, hard, unweathered, thick bedding, contorted, stylolites at ~60 degrees, fine grained, moderately fractured. Fractures at 226.5' (~90 degrees), 229.0 (~30 degrees), and 229.8' (~10 degrees). Offset healed veins near 229.9', some crystals (possibly quartz) apparent. Fossiliferous, medium dark gray.			Organic Vapor = 0.0ppm			CD 225.4'	Run 41 (225.5-230.5' bgs) Ran 5.0' Rec 4.7' Loss 0.3' UL 0.0' Water used: 503 gal, rec 0% HP 1000psi WP 70psi RQD 100% Time 21 min
	226								226
350	227					Box 20 of 21 (226.7 to 235.4' bgs)			227
	228		ls						228
	229								229
	230								230
		ls: LIMESTONE, hard, unweathered, thick bedding, contorted, stylolites at ~60 degrees, fine grained, moderately fractured. Fractures at 231.3' (~30 degrees), 232.6' (~60 degrees), 233.0' and 235.2' (~20 degrees), 233.3' and 234.3' (~10 degrees), 235.2-235.4'. Fossiliferous, medium dark gray.			Organic Vapor = 0.0ppm			CD 230.1'	Run 42 (230.5-235.4' bgs) Ran 4.9' Rec 4.9' Loss 0.0' UL 0.0' Water used: 491 gal, rec 0% HP 1000psi WP 90psi RQD 78% Time 20 min
	231								231
345	232		ls						232
	233								233

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW23

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 25 of 25 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)
	234								234
	235	NA: No recovery.	NA		Organic Vapor = 0.0ppm	Box 21 of 21 (235.4 to 240.4' bgs)		CD 235.2'	235 Run 43 (235.4-240.5' bgs) Ran 5.1' Rec 5.2' Gain 0.1' UL 0.0' Water used: 646 gal, rec 0%
	236	ls: LIMESTONE, hard, unweathered, fine grained to microcrystalline, thinly bedded at ~30 degrees, contorted, stylolites, moderately fractured, offset veins throughout. Fractures at 237.0' (~10 degrees), 237.4' and 238.4' (~30 degrees), 240.2' (~90 degrees); breccia zone at 237.5-237.6'. Light gray changing to medium dark gray at 238.4'.							236 HP 1000psi WP 90psi RQD 92.4% Time 20 min
340	237								237
	238		ls						238
	239								239
	240							CD 240.4'	240 Bottom of borehole at 240.4' bgs

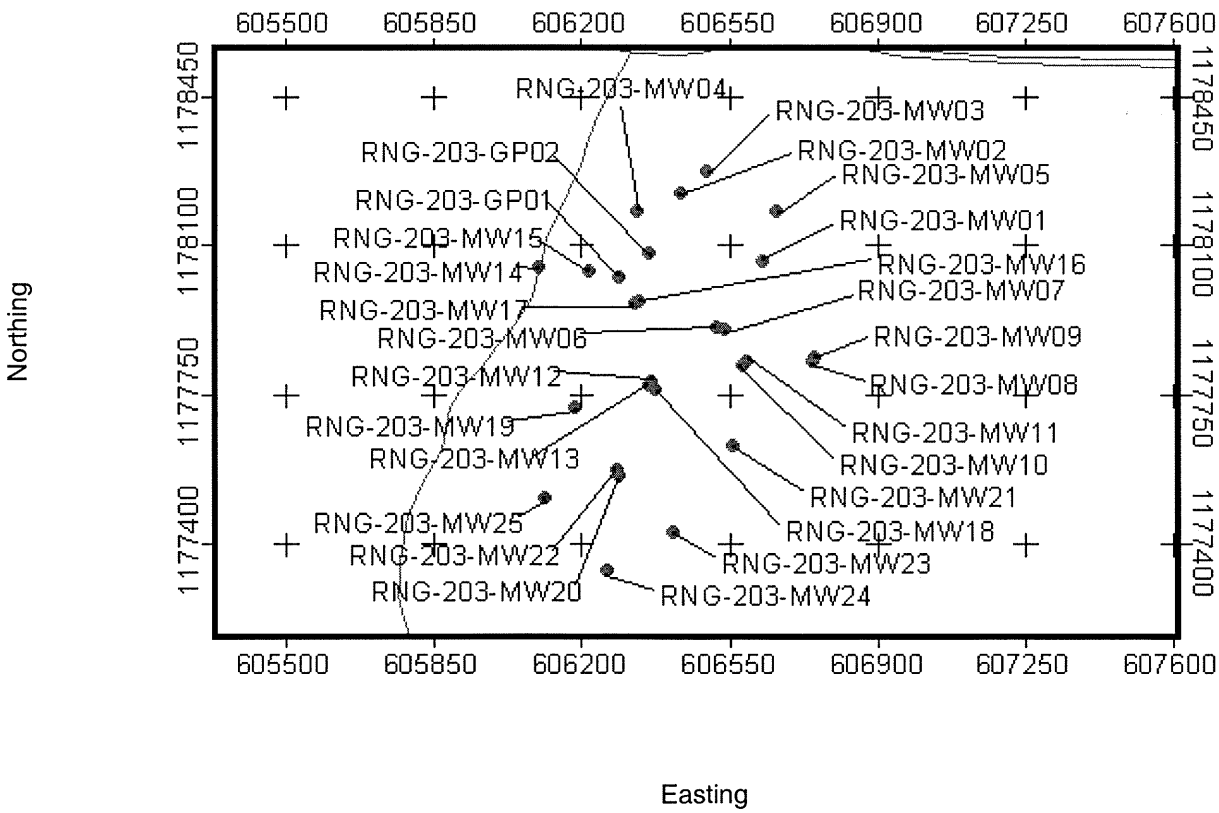
HTRW DRILLING LOG

	District: **Mobile USACE**	**HOLE NUMBER** RNG-203-MW24
1. Company name: **Shaw Environmental, Inc.**	2. Drill Subcontractor: Miller Drilling Company	Sheet 1 of 25 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Steven Gautney/Mike Martin/Glen Bilbrey	6. Mfr. designation of drill: CME-750X/Ingersoll Rand T3W
7. Sizes and types of drilling and sampling equipment: Air Rotary, Hollow Stem Auger, Triple PQ Coring HSA - 5'x4.25" ID Augers, 2'x2" Steel Split Spoons AR - 12.25" and 7.875" Tri-cone Roller Bit	8. Hole location: Range K, Parcel 203(7) 9. Surface elevation (feet above mean sea level): 569.43 10. Date started: 06/06/03 — 11. Date completed: 09/05/03
12. Overburden thickness (feet bgs): 7	15. Depth groundwater encountered (feet bgs): Unknown
13. Depth drilled into rock (feet bgs): 233.8	16. Depth to water and elapsed time after drilling completed (feet bgs): 3.54 ~72 hours
14. Total depth of hole (feet bgs): 240.8	17. Other water level measurements (specify): 13.4 after 4 days

18. Geotechnical samples:	Collected:	Disturbed:	Undisturbed:	19. Total no. of core boxes: 21		
	NA	NA	NA			
20. Samples for chemical analysis:	VOC	Metals	Other (specify)	Other (specify)	Other (specify)	21. Total core recovery:
	NA	NA	NA	NA	NA	221.0
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
	NA	2.5" Permanent	NA	Adam Day/Kyle Wilson		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 2 of 25 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: Light brown to brownish gray, moist, very soft CLAY, some Silt.	cl		Organic Vapor = 0.0ppm			1 0 1 0	HSA - Miller Drilling Company - 6/6/03 Rec 1.8'/2.0' (0-2' bgs)
	2	NA: No recovery.	NA						
		cl: Light brown to reddish brown to black, mottled, moist, soft CLAY, some Silt, trace coarse Sand.	cl		Organic Vapor = 0.0ppm			2 2 4 6	Rec 2.0'/2.0' (2-4' bgs)
	4	cl: Light brown to reddish brown to black, mottled, moist, soft CLAY, some Silt, trace coarse Sand.	cl		Organic Vapor = 0.0ppm			3 4 4 6	Rec 2.0'/2.0' (4-6' bgs)
565	6	cl: Light brown, very moist, soft CLAY, some Silt, trace coarse Sand.	cl		Organic Vapor = 0.0ppm			3 3 30/0.1'	Rec 1.1'/1.1' (6-7.1' bgs)
	7	ls: LIMESTONE, intensely fractured, angular gravel-sized fragments, unweathered, moderately hard, medium gray.	ls		Organic Vapor = 0.0ppm				Auger refusal at 7.1' bgs Air rotary - Miller Drilling Company - 6/10/03 Description from air rotary drill cuttings (7.1-14' bgs) HP 500psi
		ls: LIMESTONE, hard, no noticeable fractures.							
560	9								
	10								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 3 of 25 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		ls						
	12								
	13								
	14	NA: No sample collected for lithologic description.	NA						8" steel casing set at 14' bgs PQ Coring - Miller Drilling Company - 6/17/03 Run 1 (14.5-15.5' bgs) Ran 1.0' Rec 0.5' Loss 0.5' UL NA Water used: 200 gal, rec 100%, white HP 400psi WP 80psi Time 5 min Run 2 (15.5-20.0' bgs) Ran 4.5' Rec 5.3' Gain 0.8' UL NA Water used: 250 gal, rec 100%, white HP 750psi WP 50psi RQD 96.2% Time 20 min
555									
	15	ls: LIMESTONE, moderately hard, unweathered, microcrystalline, dark gray.	ls		Organic Vapor = 0.0ppm	Box 1 of 25 (14.5 to 24.0' bgs)		CD 14.5'	
	16	ls: LIMESTONE, moderately hard, unweathered, microcrystalline, thin contorted bedding with stylolites at ~30 degrees. Fractures at 16.1' (~90 degrees), 20.0' and 20.2' (~30 degrees). Slightly fractured, fossiliferous (crinoid stems, shells), medium dark gray.			Organic Vapor = 0.0ppm				
	17								
	18		ls						
	19								
550									
	20								Run 3 (20.0-25.0' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 4 of 25 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)
									Ran 5.0' Rec 4.0' Loss 1.0' UL 0.0' Water used: 500 gal, rec 100%
	21	ls: LIMESTONE, moderately hard, unweathered, fine grained to microcrystalline, calcite crystals (~1mm), thin contorted beds with stylolites at ~30 degrees, highly to moderately fractured. Fractures at 20.8' and 24.9' (~90 degrees), 23.1' (~30 degrees, perpendicular to bedding plane), 24.4' (~35 degrees). Fossiliferous, medium dark gray.			Organic Vapor = 0.0ppm			CD 20.8'	HP 500-800psi WP 30psi RQD 94.2% Time 23 min
	22								
	23		ls						
	24					Box 2 of 25 (24.0 to 32.5' bgs)			
545									
	25	ls: LIMESTONE, hard, unweathered, microcrystalline, thin bedded, contorted, stylolites, moderately fractured. Fracture at 22.0' (~30 degrees), 29.1' (~45 degrees). Fossiliferous (crinoids), medium dark gray.			Organic Vapor = 0.0ppm			CD 24.8'	Run 4 (25.0-29.8' bgs) Ran 4.8' Rec 4.8' Loss 0.0' UL 0.0' Water used: 600 gal, rec 100%, white HP 600psi WP 50psi RQD 100% Time 17 min
	26								
	27		ls						
	28								
	29								
540									
	30	ls: LIMESTONE, hard, unweathered, microcrystalline, thin bedded, contorted, stylolites, moderately fractured, fossiliferous (crinoids), medium dark gray.	ls		Organic Vapor = 0.0ppm			CD 29.6'	Run 5 (29.8-30.5' bgs) Ran 0.7' Rec 0.7' Loss 0.0' UL 0.2'

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 5 of 25 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		NA: No recovery.	NA		Organic Vapor = 0.0ppm			CD 30.5'	Water used: 100 gal, rec 100%, white Run 6 (30.5-35.5' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 350 gal, rec 100%, white HP 700psi WP 50-90psi RQD 100% Time 19 min
	31	ls: LIMESTONE, hard, unweathered, microcrystalline, thin bedded, contorted, stylolites, moderately fractured. Fractures: 32.4' and 33.5' (~30 degrees), 34.6' (~45 degrees). Fossiliferous (crinoids), medium dark gray.							
	32								
	33		ls			Box 3 of 25 (32.5 to 42' bgs)			
	34								
535									
	35								
	36	ls: LIMESTONE, moderately hard to hard, slightly weathered (iron staining on fracture surface at 39.2') to unweathered, thin contorted bedding with sutures at ~45 degrees, slightly fractured. Fracture at 38.8' (~90 degrees), 39.2' (~60 degrees). Fossiliferous (crinoids), possible breccia zone at 35.5- 37.2' and 39.2-40.4', medium dark gray.			Organic Vapor = 0.0ppm			CD 35.5'	Run 7 (35.5-40.5' bgs) Ran 5.0' Rec 4.9' Loss 0.1' UL 0.0' Water used: 400 gal, rec 100%, white to black HP 750psi WP 50psi RQD 93.8% Time 16 min
	37								
	38		ls						
	39								
530									
	40				Organic			CD	

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 6 of 25 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	ls: LIMESTONE, moderately hard to hard, unweathered, thin contorted bedding with sutures at ~45 degrees, intact, fossiliferous (crinoids), medium dark gray.	ls		Vapor = 0.0ppm	Box 4 of 25 (42 to 51.5' bgs)		40.4'	Run 8 (40.5-45.5' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.3' Water used: 250 gal, rec 100%, white HP 750psi WP 50psi RQD 100% Time 15 min
	42								
	43								
	44								
525	45								
		NA: No recovery.	NA						
	46	ls: LIMESTONE, moderately hard, unweathered, fine grained to microcrystalline, thin contorted bedding with sutures at ~45 degrees, moderately fractured. Fractures at 47.6' and 49.3' (~90 degrees) and 46.0' (~45 degrees, offset). Fossiliferous (crinoids), medium dark gray.			Organic Vapor = 0.0ppm			CD 45.7'	Run 9 (45.5-50.5' bgs) Ran 5.0' Rec 4.7' Loss 0.3' UL 0.0' Water used: 425 gal, rec 100%, white HP 650psi WP 50psi RQD 93.6% Time 18 min
	47								
	48		ls						
	49								
520	50								
		ls: LIMESTONE, moderately hard,			Organic Vapor			CD 50.4'	Run 10 (50.5-55.5' bgs)

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 7 of 25 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	51	unweathered, fine grained to microcrystalline, thin contorted bedding with sutures at ~45 degrees, moderately fractured. Fractures at 53.3' (~90 degrees) and 54.9' (~30 degrees), zone with offset from 54.0' - 55.3'.			= 0.0ppm				Ran 5.0' Rec 4.9' Loss 0.1' UL 0.0' Water used: 200 gal, rec 100%, white HP 650psi WP 50psi RQD 100% Time 18 min
	52					Box 5 of 25 (51.5 to 60.5' bgs)			
	53		ls						
	54								
515	55								
	56	ls: LIMESTONE, moderately hard, unweathered, fine grained to microcrystalline, thin contorted bedding with sutures at ~45 degrees, moderately to intensely fractured. Fracture zone at 58.2 - 58.5' with yellowish brown soft Clay in fracture, fracturea at 58.9' (~30 degrees), 59.7' (~90 degrees), zone from 55-59.9 (0 degrees). Fossiliferous (crinoids), medium dark gray.			Organic Vapor = 0.0ppm			CD 55.3'	Run 11 (55.5-60.5' bgs) Ran 5.0' Rec 5.2' Gain 0.2' UL 0.0' Water used: 300 gal, rec 100%, white HP 650psi WP 50psi RQD 73% Time 16 min
	57								
	58		ls						
	59								
510	60								
		ls: LIMESTONE, hard, slightly weathered, medium grained to microcrystalline, thin			Organic Vapor	Box 6 of 25		CD 60.5'	Run 12 (60.5-65.5' bgs) Ran 5.0' Rec 5.0'

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 8 of 25 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	61	contorted bedding with sutures at ~45 degrees, moderately fractured. Fracture at 63.3' (~10 degrees), 62.0-62.7' (~45 degrees, slickensides, yellowish brown Clay, calcite deposits). Possible iron staining, fossiliferous (crinoids), medium dark gray.			= 0.0ppm	(60.5 to 69.9' bgs)			Loss 0.0' UL 0.0' Water used: 525 gal, rec 100%, white HP 700psi WP 60psi RQD 100% Time 12 min
	62								
	63		ls						
	64								
505	65								
	66	ls: LIMESTONE, hard to moderately hard, unweathered, medium grained to microcrystalline, slightly fractured. Fracture at 69.2' (~90 degrees). Fossiliferous (crinoids), medium dark gray.			Organic Vapor = 0.0ppm			CD 65.5'	Run 13 (65.5-70.5' bgs) Ran 5.0' Rec 4.9' Loss 0.1 UL 0.0' Water used: 600 gal, rec 100%, white to light brown HP 600psi WP 50psi RQD 100% Time 15 min
	67								
	68		ls						
	69								
500	70					Box 7 of 25 (69.9 to 79.7' bgs)			
	71	ls: LIMESTONE, hard, slightly weathered (iron staining, clay in fractures), fine to medium grained, slightly fractured. Fracture at 73.7' (~45 degrees, iron stained, clay in fracture).			Organic Vapor = 0.0ppm			CD 70.4'	Run 14 (70.5-75.5' bgs) Ran 5.0' Rec 5.1' Gain 0.1' UL 0.0'

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 9 of 25 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	71	Fossiliferous (crinoids), thin contorted beds with stylolites, medium gray.							Water used: 525 gal, rec 100%, white to light brown HP 650psi WP 70psi RQD 100% Time 15 min
	72								
	73		ls						
	74								
495	75								
	76	ls: LIMESTONE, hard, slightly weathered (iron staining, clay in fractures), fine to medium grained, moderately fractured. Fracture at 80.0' (~90 degrees), joint at 77.1' (~45 degrees, iron staining and calcite infill, possible slickensides). Fossiliferous (crinoids), thin contorted beds with sutures, medium gray.			Organic Vapor = 0.0ppm			CD 75.5'	Run 15 (75.5-80.5' bgs) Ran 5.0' Rec 4.9' Loss 0.1' UL 0.0' Water used: 350 gal, rec 100%, white HP 650psi WP 50psi RQD 100% Time 14 min
	77								
	78		ls						
	79								
490	80					Box 8 of 25 (79.7 to 89.2 bgs)			
	81	ls: LIMESTONE, hard, slightly weathered (iron staining, clay in fractures), fine to medium grained, moderately fractured. Fracture at 81.5' (~45 degrees, iron staining). Fossiliferous (crinoids), thin contorted beds			Organic Vapor = 0.0ppm			CD 80.4'	Run 16 (80.5-85.5' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.2' Water used: 300 gals, rec

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 10 of 25 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)
		with sutures, medium gray.							100%, white HP 650psi WP 50psi RQD 100% Time 16 min
	82								
	83		ls						
	84								
485									
	85								
		NA: No recovery.	NA						
	86	ls: LIMESTONE, hard, slightly weathered (iron staining, clay in fractures), fine to medium grained, moderately fractured. Fracture at 88.8' (~45 degrees, iron staining and Clay in fracture). Fossiliferous (crinoids), thin contorted beds with sutures, medium gray.			Organic Vapor = 0.0ppm			CD 85.6'	Run 17 (85.5-90.5' bgs) Ran 5.0' Rec 4.7' Loss 0.3' UL 0.2' Water used: 425 gal, rec 100%, white to light brown HP 650psi WP 50psi RQD 100% Time 22 min
	87								
	88		ls						
	89								
480						Box 9 of 25 (89.2 to 98.8' bgs)			
	90								
		NA: No recovery.	NA						
	91	ls: LIMESTONE, hard, slightly weathered (iron staining, clay in fractures), fine to medium grained, slightly fractured. Fracture at 93.6' (~45 and 90 degrees, iron staining). Fossiliferous (crinoids), thin contorted beds			Organic Vapor = 0.0ppm			CD 90.5'	Run 18 (90.5-95.5' bgs) Ran 5.0' Rec 4.8' Loss 0.2' UL 0.0' Water used: 400 gal, rec 100%, white

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 11 of 25 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)
		with sutures, medium gray.							HP 650psi WP 50psi RQD 100% Time 16 min
	92								
	93		ls						
	94								
475									
	95								
		ls: LIMESTONE, hard, slightly weathered (iron staining, clay in fractures), fine to medium grained, slightly fractured. Fracture at 100.2' (~90 degrees). Fossiliferous (crinoids, possibly coral), thin contorted beds with sutures, medium gray.			Organic Vapor = 0.0ppm			CD 95.3'	Run 19 (95.5-100.5' bgs) Ran 5.0' Rec 5.2' Gain 0.2' UL 0.0' Water used: 350 gal, rec 100%, white HP 680psi WP 40psi RQD 94.3% Time 15 min
	96								
	97								
	98		ls						
	99					Box 10 of 25 (98.8 to 108.8' bgs)			
470									
	100								
		ls: LIMESTONE, hard, slightly weathered (iron staining, clay in fractures), fine to medium grained, slightly fractured. Fractures at 103.6' (~90 degrees) and 104.7' (~45 degrees, iron staining). Fossiliferous (crinoids), thin contorted beds with sutures, medium gray.			Organic Vapor = 0.0ppm			CD 100.5'	Run 20 (100.5-105.5' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 500 gal, rec 100%, brown HP 650psi WP 50psi
	101								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 12 of 25 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)
									RQD 100% Time 19 min
	102								
	103		ls						
	104								
465									
	105								
		ls: LIMESTONE, hard, slightly weathered (iron staining, clay in fractures), fine to medium grained, slightly fractured. Joint at 113.5' (~45 degrees, iron staining and calcite), fracture at 115.0' (~30 degrees, iron staining). Fossiliferous (crinoids), thin contorted beds with sutures, medium gray.			Organic Vapor = 0.0ppm			CD 105.5'	Run 21 (105.5-110.5' bgs) Ran 5.0 Rec 5.0' Loss 0.0' UL 0.0' Water used: 350 gal, rec 100%, white HP 680psi WP 50psi RQD 100% Time 16 min
	106								
	107								
	108		ls						
	109					Box 11 of 25 (108.8 to 117.7' bgs)			
460									
	110								
		ls: LIMESTONE, hard, slightly weathered (iron staining, clay in fractures), fine to medium grained, slightly fractured. Fractures at 111.3' (~30 degrees, iron staining and reddish brown Clay), 112.9' (~45 degrees), 113.5' and 114.1' (~90 degrees). Fossiliferous (crinoids), thin contorted beds with sutures, medium gray.			Organic Vapor = 0.0ppm			CD 110.5'	Run 22 (110.5-115.5' bgs) Ran 5.0' Rec 4.9' Loss 0.1' UL 0.1' Water used: 425 gal, rec 100%, light brown HP 680psi WP 50psi RQD 100%
	111								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 13 of 25 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)
									Time 15 min
	112								
	113		ls						
	114								
455									
	115								
		NA: No recovery.	NA						
	116	ls: LIMESTONE, hard, slightly weathered (iron staining, clay in fractures), fine to medium grained, slightly fractured. Fracture at 120.2' (~90 degrees). Fossiliferous (crinoids), thin contorted beds with sutures, medium gray.			Organic Vapor = 0.0ppm			CD 115.5'	Run 23 (115.5-120.5' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 325 gal, rec 100%, white HP 680psi WP 50psi RQD 98% Time 14 min
	117								
	118		ls			Box 12 of 25 (117.7 to 125.5' bgs)			
	119								
450									
	120								
		ls: LIMESTONE, hard to moderately hard, unweathered, intact, thin contorted bedding, fossiliferous (crinoids), medium gray.			Organic Vapor = 0.0ppm			CD 120.5'	Run 24 (120.5-125.5' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 300 gal, rec 83%, brown to white HP 650psi WP 50psi RQD 100% Time 15 min
	121								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 14 of 25 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	122								
	123		ls						
	124								
445									
	125								
	126	ls: LIMESTONE, hard to moderately hard, unweathered, intact, thin contorted bedding, moderately fractured. Fractures at 127.6' (~30 and 90 degrees, calcite) and 129.6'. Fossiliferous (crinoids), medium gray.			Organic Vapor = 2.5ppm	Box 13 of 25 (125.5 to 134.5' bgs)		CD 125.5'	Run 25 (125.5-130.5' bgs) Ran 5.0' Rec 5.1' Gain 0.1' UL 0.0' Water used: 300 gal, rec 83%, brown to white HP 650psi WP 50psi RQD 100% Time 15 min
	127								
	128		ls						
	129								
440									
	130								
	131	ls: LIMESTONE, hard to moderately hard, unweathered, thin contorted bedding, intact, little brown Clay. Fossiliferous (crinoids), medium gray.			Organic Vapor = 0.0ppm			CD 130.6'	Run 26 (130.5-135.5' bgs) Ran 5.0' Rec 4.7' Loss 0.3' UL 0.0' Water used: 300 gal, rec 100%, brown to white HP 650psi WP 50psi RQD 100% Time 15 min

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 15 of 25 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	132								
	133		ls						
	134								
435						Box 14 of 25 (134.5 to 144' bgs)			
	135								
		ls: LIMESTONE, moderately hard, slightly weathered, thin contorted bedding, medium to fine grained, moderately to highly jointed. Fracture zone from 135.5-136.0' with possible breccia, ~1" angular limestone clasts recemented with fine grained Limestone and iron stained fossil hash, fractures at 136.9' (~30 degrees) and 139.7' (~90 degrees). Fossiliferous (crinoids), medium gray with light olive gray clasts in fracture zone.			Organic Vapor = 0.0ppm			CD 135.3'	Run 27 (135.5-140.5' bgs) Ran 5.0' Rec 4.9' Loss 0.1' UL 0.3' Water used: 400 gal, rec 100%, brown to white HP 650psi WP 50-100psi RQD 75% Time 15 min
	136								
	137								
			ls						
	138								
	139								
430									
	140								
		NA: No recovery.	NA						
		ls: LIMESTONE, hard, unweathered, microcrystalline to medium grained, intact, thin contorted bedding, fossiliferous (crinoids), medium gray.			Organic Vapor = 0.0ppm			CD 140.5'	Run 28 (140.5-145.5' bgs) Ran 5.0' Rec 4.8' Loss 0.0' UL 0.0' Water used: 300 gal, rec 100%, brown to white HP 680psi WP 50psi RQD 100% Time 17 min
	141								
	142								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 16 of 25 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)
	143		ls						143
	144					Box 15 of 25 (144 to 152.8' bgs)			144
425									
	145								145
		ls-sh: Interbedded LIMESTONE and SHALE. Limestone is hard, slightly weathered, microcrystalline to medium grained, fossiliferous, thin contorted bedding, highly to moderately fractured. Shale is moderately hard, moderately weathered, iron stained, fine grained, parted to banded beds, contorted slickensides, non-calcareous, no fossils, moderate yellowish brown. Fractures at 145.5-146.3' (~0 degrees, iron stained, calcite infill), 146.3' (~40 degrees), 147.4 - 147.6' (slickensides, iron stained brown Shale, calcite) and 148.3-148.4' (~40 degrees, brown Shale and iron staining), 148.6' (~40 degrees), 148.8' (~40 degrees, slickensides). Grayish black mottled with shale-colored spots from 148.4 - 149.5.			Organic Vapor = 0.0ppm			CD 145.3'	Run 29 (145.5-150.5' bgs) Ran 4.0' Rec 4.0' Loss 0.0' UL 0.0'
	146								Water used: 800 gal 146 HP 650-820psi WP 50-60psi RQD 80% Time 50 min
	147		ls-sh						147
	148								148
	149								149
420		ls: LIMESTONE, hard, slightly weathered, iron stained, fine grained to microcrystalline, intact. Highly fractured, fractures at 149.5' (~60 degrees, little gray non-calcareous Shale) and 150.5' (~40 degrees). Thin contorted beds, grayish black to light gray.			Organic Vapor = 0.0ppm			CD 149.3'	Run 30 (149.5-150.5' bgs) Ran 1.0' Rec 1.2' Gain 0.2' UL 0.0'
	150		ls						Water used: 400 gal, rec 100%, brown to white 150 HP 650psi WP 50psi RQD 100% Time 12 min
		ls-sh: Interbedded LIMESTONE and SHALE. Limestone is hard, moderately weathered (iron stained fractures), microcrystalline to medium grained, thin contorted bedding at ~40 degrees. Shale is gray, in fractures parallel to bedding, highly to intensely fractured. Fractures at 151.1' (~45 degrees), 151.2' and 152.5' (~10 degrees), 152.6-153.7' (zone, ~0 and 40 degrees), 154.2' (~40 degrees), 154.6-154.8' (zone, ~40 degrees), 155.0' (~30 degrees). All fractures iron stained, some with slickensides. Colors: light gray (150.5-151.2'),			Organic Vapor = 0.0ppm			CD 150.5'	Run 31 (150.5-155.5' bgs) Ran 5.0' Rec 5.0'
	151								Loss 0.0' UL 0.0' 151 Water used: 650 gal, rec 46%, brown to gray WP 40psi RQD 20% Time 49 min
	152								152

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 17 of 25 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 and banded grayish black to light gray to moderate yellowish brown (151.2-154.5'), and light gray to grayish black (154.5-155.5').	ls-sh			Box 16 of 25 (152.8 to 161.8' bgs)			
	153								153
	154								154
415									
	155								155
		ls: LIMESTONE, hard, slightly weathered, thin contorted bedding, microcrystalline to medium grained, fossiliferous (crinoids), slightly to moderately fractured. Fractures at 157.3' (~45 degrees, iron stained), 158.4' and 158.7 (~10 degrees). Light gray to grayish black.			Organic Vapor = 0.0ppm			CD 155.5'	Run 32 (155.5-160.3' bgs) Ran 4.8' Rec 4.7' Loss 0.1' UL 0.1' Water used: 500 gal, rec 80%, white to gray HP 1000psi WP 50psi RQD 20% Time 43 min
	156								156
	157								157
	158		ls						158
	159								159
410									
	160								160
		NA: No recovery.	NA					CD 160.3'	Run 33 (160.3-160.5' bgs) Ran 0.2' Rec 0.5' Gain 0.3' UL 0.0' Water used: 50 gal, rec 100%, light brown HP 800psi WP 50psi RQD 100% Time 5 min
		ls: LIMESTONE, hard, slightly weathered, thin contorted bedding, intact, microcrystalline to medium grained, fossiliferous (crinoids), iron staining and possible slickensides on ~45 degree fracture surface at 160.7', light gray to dark gray.	ls		Organic Vapor = 0.0ppm Organic Vapor = 0.0ppm			CD 160.7'	
	161								161
		ls: LIMESTONE, hard, moderately weathered, fine grained, fossiliferous (crinoids), intensely fractured (~45, 60, and 90 degrees), calcite and iron staining in fractures, black to light gray with little light brown mottling.				Box 17 of 25 (161.8			Run 34 (160.5-165.5' bgs) Ran 5.0' Rec 4.8' Loss 0.2' UL 0.0' Water used: 1075 gal, rec 65%, light brown to light gray
	162								162

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 18 of 25 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)
						to 171.7' bgs)			HP 650-800psi WP 50-90psi RQD 0% Time 75 min
	163		ls						
	164								
405									
	165								
	166	ls: LIMESTONE, hard, moderately weathered, fine grained, fossiliferous (crinoids), intensely fractured (~45, 60, and 90 degrees), calcite and iron staining in fractures, black to light gray with little light brown mottling.			Organic Vapor = 0.0ppm			CD 165.5'	Run 35 (165.5-170.5' bgs) Ran 5.0' Rec 4.5' Loss 0.5' UL 0.0' Water used: 600 gal, rec 51%, light brown HP 600-800psi WP 50-90psi RQD 15.5% Time 37 min
	167								
	168		ls						
	169								
400									
	170	ls: LIMESTONE, hard, moderately weathered, fine grained, fossiliferous (crinoids), intensely fractured (~45, 60, and 90 degrees), calcite and iron staining in fractures, black to light gray with little light brown mottling, quartz nodule at 171.5'.			Organic Vapor = 0.0ppm			CD 170.0'	Run 36 (170.5-174.6' bgs) Ran 4.1' Rec 4.4' Gain 0.3' UL 0.0' Water used: 802 gal, rec 35%, light brown to light gray HP 650psi WP 50psi RQD 0% Time 76 min
	171								
	172		ls			Box 18 of 25 (171.7 to 179.4'			

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 19 of 25 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)
						bgs)			
	173								173
	174								174
395		ls: LIMESTONE, hard, moderately weathered, fine grained, fossiliferous (crinoids), intensely fractured (~45, 60, and 90 degrees), calcite and iron staining in fractures, black to light gray with little light brown mottling, shell fossil at 175.3', fracture at 175.9' (~45 degrees, striations on surface).	ls		Organic Vapor = 0.0ppm			CD 174.4'	Run 37 (174.6-175.5' bgs) Ran 0.9' Rec 0.8' Loss 0.1' UL 0.1' Water used: 211 gal, rec 65%, light brown HP 300psi WP 90psi RQD 0% Time 15 min
	175	NA: No recovery.	NA ls		Organic Vapor = 0.0ppm			CD 175.3'	175 Run 38 (175.5-175.7' bgs) Ran 0.2' Rec 0.2' Loss 0.0' UL 0.3' Water used: 165 gal, rec 55%, light brown
		ls: LIMESTONE, moderately hard, intensely fractured, thinly bedded, fine to medium grained, fossiliferous, grayish black to medium black.	NA		Organic Vapor = 0.0ppm			CD 175.8'	HP 500-800psi WP 20-100psi RQD 0%
	176	NA: No recovery.	ls						176
		ls: LIMESTONE, moderately hard, intensely fractured, thinly bedded, fine to medium grained, fossiliferous, grayish black to medium black.	NA		Organic Vapor = 0.0ppm			CD 176.8'	Run 39 (175.7-176.7' bgs) Ran 1.0' Rec 0.8' Loss 0.2' UL 0.2' Water used: 269 gal, rec 46%, light brown to light gray HP 500-1000psi WP 50-90psi
	177	NA: No recovery.	ls					CD 177.4'	177 RQD 0%
		ls: LIMESTONE, moderately hard, moderately weathered, microcrystalline to fine grained, intensely fractured, thin bedding, fossiliferous (crinoids), iron stained fractures, black to light gray mottled with light brown.	ls NA		Organic Vapor = 0.0ppm			CD 177.7' CD 178.0'	Run 40 (176.7-177.6' bgs) Ran 0.9' Rec 0.6' Loss 0.3' UL 0.0' Water used: 207 gal, rec 36%, light brown to white HP 500-900psi WP 50-100psi RQD 0% Time 9 min
	178	ls: LIMESTONE, moderately hard, moderately weathered, microcrystalline to fine grained, intensely fractured, thin bedding, fossiliferous (crinoids), iron stained fractures, black to light gray mottled with light brown.							178
	179	ls: LIMESTONE, moderately hard, moderately weathered, microcrystalline to fine grained, intensely fractured, thin bedding, fossiliferous (crinoids), iron stained fractures, black to light gray mottled with light brown.	ls						179 Run 41 (177.6-177.9' bgs) Ran 0.3' Rec 0.3' Loss 0.0' UL 0.0' Water used: 169 gal, rec 55% HP 300-900psi WP 50psi RQD 0% Time 13 min
390	180	ls: LIMESTONE, moderately hard, moderately weathered, microcrystalline to fine grained, intensely fractured, thin bedding, fossiliferous (crinoids), iron stained fractures, black to light gray mottled with light brown.				Box 19 of 25 (179.4 to 187.7' bgs)			180 Run 42 (177.9-178.1' bgs) Ran 0.2' Rec 0.2' Loss 0.0' UL 0.1' Water used: 77 gal, rec 55%, light brown HP 900psi WP 100psi Time 6 min
		NA: No recovery.	NA		Organic Vapor = 0.0ppm			CD 180.7'	181 Run 43 (178.1-180.5' bgs) Ran 2.5' Rec 2.4' Loss 0.1' UL 0.3' Water used: 426 gal, rec 62%, brown to light gray HP 500-650psi WP 50psi RQD 23% Time 16 min
	181	ls: LIMESTONE, moderately hard, moderately weathered, microcrystalline to fine grained, intensely fractured, iron stained, little Clay in fractures (~30 and 60 degrees), fossiliferous (crinoids, shells), light gray to grayish black.							182 Run 44 (180.5-185.5' bgs) Ran 5.0' Rec 4.8' Loss 0.2' UL 0.0'
	182	ls: LIMESTONE, moderately hard, slightly weathered (iron stained fractures), microcrystalline to fine grained, highly to moderately fractured. Fractures at 180.8' (~60 degrees), 182.0' and 184.4' (~45 degrees), 182.3' (~10 degrees), and 184.7' (~30 degrees). Thin contorted bedding, fossiliferous (crinoids), light gray to black.							

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 20 of 25 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)
	183		ls						Water used: 906 gal, rec 72%, gray HP 600psi WP 80psi RQD 95% Time 54 min
	184								
385									
	185								
	186	ls: LIMESTONE, hard to moderately hard, slightly weathered (Clay and iron staining in fractures), microcrystalline to fine grained, fossiliferous (crinoids), moderately to highly fractured, large pitting at 190.4'. Fractures at 186.1' (~60 degrees), 187.5' (~75 degrees), 189.9' (~45 degrees), and 190.4' (~20 degrees). Thin contorted bedding, light gray to grayish black.			Organic Vapor = 0.0ppm			CD 185.5'	Run 45 (185.5-190.5' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 762 gal, rec 70%, brown to gray HP 500-950psi WP 100psi RQD 90% Time 44 min
	187								
	188		ls			Box 20 of 25 (187.7 to 198.2' bgs)			
	189								
380									
	190								
	191	ls: LIMESTONE, moderately hard, slightly weathered (iron stained fractures near void), microcrystalline to fine grained, fossiliferous (crinoids), moderately fractured. Fracture at 193.3' (~90 degrees), thin contorted bedding, light gray to grayish black.			Organic Vapor = 5.5ppm			CD 190.5'	Run 46 (190.5-195.5' bgs) Ran 5.0' Rec 3.1' Loss 1.9' UL 1.9' Water used: 407 gal, rec 69%, brown to gray HP 900psi WP 80psi RQD 60% Time 22 min
	192		ls						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 21 of 25 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)
	193								
		NA: VOID, some orangish brown Clay.							
	194								
375			NA						
	195								
		ls: LIMESTONE, moderately hard, slightly weathered, iron stained fractures, fine grained to microcrystalline, thin contorted bedding, moderately fractured. Fractures at 197.9' (~20 degrees) and 199.1-199.6'. Fossiliferous (crinoids), light gray to grayish black.			Organic Vapor = 0.0ppm			CD 195.5'	Run 47 (195.5-200.0' bgs) Ran 4.5' Rec 4.5' Loss 0.0' UL 0.0' Water used: 523 gal, rec 75%, brown HP 950psi WP 90psi RQD 77.7% Time 31 min
	196								
	197								
			ls			Box 21 to 25 (198.2 to 205.8' bgs)			
	198								
	199								
370									
	200	ls: LIMESTONE, moderately hard, fine grained, contorted bedding planes, pitted, iron stained, intensely fractured, fossiliferous, black portions are dolomitic, moderately weathered, black to medium gray.	ls		Organic Vapor = 0.0ppm			CD 200.0'	Run 48 (200.0-200.8' bgs) Ran 0.8' Rec 0.6' Loss 0.2' UL 0.0' Water used: 652 gal, rec 7%, brown HP 1000psi WP 80psi RQD 0% Time 5 min
					Organic Vapor = 0.0ppm			CD 200.6'	
	201	ls: LIMESTONE, hard, slightly weathered, fine to medium grained, banded and contorted bedding at ~45 degrees, fossiliferous, highly fractured. Fractures at 201.5-202.0' (~15 and 45 degrees), 203.2' (~30 degrees), 203.5' (~30 degrees, carbonate sand in fracture), 204.0' (~60 degrees), 205.0' (0 degrees), and 205-205.7' (some medium calcareous Sand). Linear fossils, greenish gray on two surfaces, iron stained, black to medium gray.							Run 49 (200.8-205.8' bgs) Ran 5.0' Rec 5.2' Gain 0.2' UL 0.0' Water used: 718 gal, rec 2%, brown HP 950psi WP 80psi RQD 67.3% Time 14 min
	202								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 22 of 25 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)
	203		ls						
	204								
365									
	205								
	206	ls: LIMESTONE, hard, slightly weathered, fine to medium grained, banded and contorted bedding at ~45 degrees, fossiliferous, slightly fractured. Fractures at 206.6' (~15 degrees) and 209.8-209.9' (fine to medium calcareous Sand and possible fossils). Greenish gray on two surfaces, iron stained, black to medium gray.			Organic Vapor = 0.0ppm	Box 22 of 25 (205.8 to 215.8' bgs)		CD 205.8'	Run 50 (205.8-210.8' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.1' Water used: 774 gal, rec 4%, brown HP 1000psi WP 100psi RQD 100% Time 17 min
	207								
	208		ls						
	209								
360									
	210								
	211	NA: No recovery.	NA		Organic Vapor = 0.0ppm			CD 210.9'	Run 51 (210.8-215.8' bgs) Ran 5.0' Rec 4.8' Loss 0.2' UL 0.0' Water used: 675 gal, rec 2%, brown HP 1000psi WP 100psi RQD 72.9% Time 13 min
	212	ls: LIMESTONE, hard, slightly weathered, fine to medium grained, banded and contorted bedding at ~45 degrees, fossiliferous, slightly fractured. Fractures at 211.1- 211.2' (90 degrees, iron stained), 213.4', 213.5', and 213.8' (~90 degrees), and 214.6-215.1' (~90 degrees, fine to medium carbonate Sand in fracture). Black to medium gray.							
	213								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 23 of 25 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)
355	214		ls						
	215								
	216	ls: LIMESTONE, hard, slightly weathered, banded and contorted bedding, fossiliferous, fine grained, slightly fractured. Fracture zone at 217.5-217.6' (~90 degrees). Medium gray.			Organic Vapor = 0.0ppm	Box 23 of 25 (215.8 to 226.1' bgs)		CD 215.7'	Run 52 (215.8-220.8' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.3' Water used: 650 gal, rec 0% HP 1000psi WP 90psi RQD 100% Time 9 min
	217								
	218		ls						
	219								
350	220								
	221	NA: No recovery.	NA						
		ls: LIMESTONE, hard, slightly weathered, banded and contorted bedding, fossiliferous, fine grained, slightly fractured. Fractures at 221.1' (~90 degrees), 222.0' (~45 degrees), 222.8' (~60 and 90 degrees). Grayish green to medium gray.			Organic Vapor = 0.0ppm			CD 221.0'	Run 53 (220.8-225.8' bgs) Ran 5.0' Rec 4.2' Loss 0.8' UL 0.0' Water used: 1800 gal, rec 6%, brown HP 1000psi WP 80psi RQD 92.8% Time 16 min
	222								
	223		ls						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 24 of 25 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)
345	224								
	225								
	226	ls: LIMESTONE, hard, slightly weathered, banded and contorted bedding, fossiliferous, fine grained, slightly fractured. Fractures at 228.0-228.1' (~90 degrees) and 229.0' (~10 degrees). Grayish green to medium gray.	ls		Organic Vapor = 0.0ppm	Box 24 of 25 (226.1 to 235.8' bgs)		CD 225.2'	Run 54 (225.8-230.5' bgs) Ran 4.7' Rec 5.2' Gain 0.5' UL 0.1' Water used: 1087 gal, rec 4%, brown HP 1000psi WP 90psi RQD 96.2% Time 33 min
	227								
	228								
	229								
340	230								
	231	NA: No recovery. ls: LIMESTONE, hard, slightly weathered, banded and contorted bedding, fossiliferous, fine grained, slightly fractured. Fractures at 233.3-233.4' (~60 and 90 degrees, with calcite). Grayish green to medium gray.	NA ls		Organic Vapor = 0.0ppm			CD 230.5'	Run 55 (230.5-235.8' bgs) Ran 5.3' Rec 5.2' Loss 0.1' UL 0.1' Water used: 934 gal, rec 10%, brown HP 1000psi WP 90psi RQD 96.2% Time 30 min
	232								
	233								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW24

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 25 of 25 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)
335	234								234
	235								235
	236	NA: No recovery. ls: LIMESTONE, hard, slightly weathered, banded and contorted bedding, fossiliferous, fine grained. Fractures at 240.4- 240.8' (possibly mechanical). Grayish green to medium gray.	NA ls		Organic Vapor = 0.0ppm	Box 25 of 25 (235.8 to 240.8' bgs)		CD 235.8'	Run 56 (235.8-240.8' bgs) Ran 5.0' Rec 5.0' Loss 0.0' UL 0.0' Water used: 1289 gal, rec 11%, light brown HP 1000psi WP 90psi RQD 92% Time 28 min
	237								237
	238								238
	239								239
330	240								Air rotary - Miller Drilling Company - 8/27/03 Overdrill to 240' bgs 240
								CD 240.8'	Bottom of borehole at 240.8' bgs

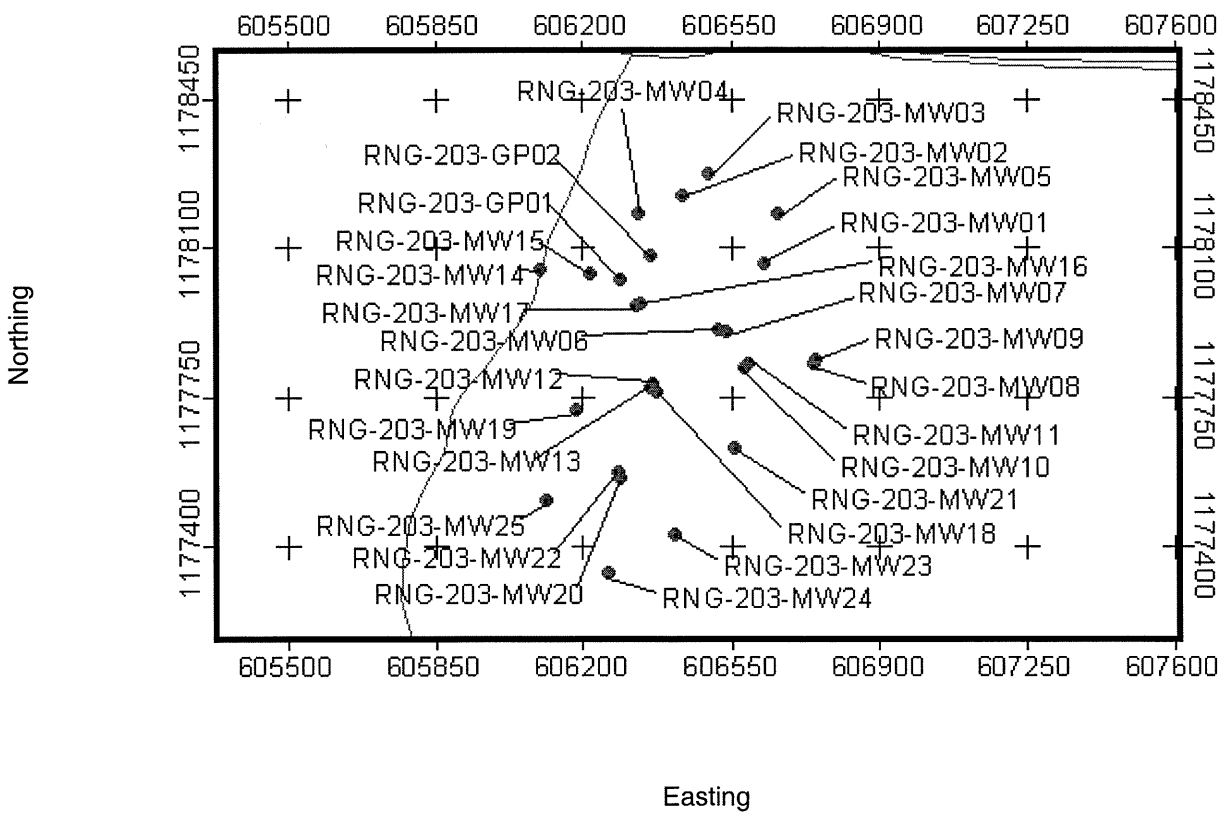
HTRW DRILLING LOG

District: **Mobile USACE**		**HOLE NUMBER** RNG-203-MW25
1. Company name: **Shaw Environmental, Inc.**	2. Drill Subcontractor: Miller Drilling Company	Sheet 1 of 21 sheets

3. Project: Fort McClellan	4. Location: **Calhoun County, Alabama**
5. Name of driller: Glen Bilbrey/Mike Martin	6. Mfr. designation of drill: CME-750X/Ingersoll Rand T3
7. Sizes and types of drilling and sampling equipment: Hollow Stem Auger, Air Rotary HSA - 5'x4.25" ID Augers, 2'x2" Steel Split Spoons AR - 12.25 and 7.875" Tri-cone Roller Bits	8. Hole location: Range K, Parcel 203(7) 9. Surface elevation (feet above mean sea level): 568.88 10. Date started: 08/21/03 — 11. Date completed: 09/18/03
12. Overburden thickness (feet bgs): 13	15. Depth groundwater encountered (feet bgs): 13
13. Depth drilled into rock (feet bgs): 187	16. Depth to water and elapsed time after drilling completed (feet bgs): 2 ~24 hours
14. Total depth of hole (feet bgs): 200	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:
	NA	NA	NA	NA	NA	NA
22. Disposition of hole:	Backfilled	Monitoring well	Other (specify)	Geologist:		
	NA	2.5" Permanent	NA	Adam Day/Kyle Wilson		

LOCATION SKETCH/COMMENTS:



HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 2 of 21 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: Brown, moist, soft CLAY, some Silt.	cl		Organic Vapor = 0.0ppm			0 1 1 2	HSA - Miller Drilling Company - 8/21/03 Rec 1.8'/2.0' (0-2' bgs)
	2	NA: No recovery.	NA						
	2	cl: Light brown to gray, mottled, moist, stiff CLAY, some Silt.	cl		Organic Vapor = 0.0ppm			2 5 8 10	Rec 2.0'/2.0' (2-4' bgs)
565	4	cl: Light brown to gray to reddish brown, hard, dry, mottled and laminated CLAY, some Silt, little fine to coarse reddish brown Sand.	cl		Organic Vapor = 0.0ppm			9 14 18 19	Rec 2.0'/2.0' (4-6' bgs)
	6	cl: Light brown to reddish brown, hard, dry, laminated CLAY, little gray Silt, little reddish brown Sand.	cl		Organic Vapor = 0.0ppm			15 22 27 29	Rec 2.0'/2.0' (6-8' bgs)
	8	cl: Reddish brown, laminated, dry to moist, hard CLAY.	cl		Organic Vapor = 0.0ppm			22 30 32 40	Rec 2.0'/2.0' (8-10' bgs)
560	9								
	10								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 3 of 21 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
		cl: Light brown, soft, moist CLAY.	cl		Organic Vapor = 0.0ppm			8 21 29 24	Rec 2.0'/2.0' (10-12' bgs)
		cl: Black to reddish brown, dry, hard, laminated CLAY.	cl						
	11								11
	12	NA: No sample collected for lithologic description.	NA						12
									Auger refusal at 12.5' bgs
		cl: Light brown, soft, moist CLAY.	cl		Organic Vapor = 0.0ppm			5 25/0.1'	Rec 0.6'/0.6' (12.5-13.1' bgs)
	13	ls: LIMESTONE, hard, shaley, microcrystalline, calcite veins, blackish gray.	ls		Organic Vapor = 0.0ppm				Split spoon refusal at 13.1' 13
		ls-sh: Interbedded SHALE and LIMESTONE, soft, calcite veins throughout, slightly hard, dark gray to black.							Air rotary - Miller Drilling Company - 9/9/03 Description from air rotary drill cuttings (13.1-200' bgs)
555	14								14
	15								15
			ls-sh						
	16								16
	17								17
	18	ls-sh: Interbedded SHALE and LIMESTONE, soft, calcite veins throughout, slightly hard, dark gray to black.			Organic Vapor = 0.0ppm				8" steel casing set at 18' bgs 18 HP 600psi Drill action: smooth No water used Time 25 min
550	19		ls-sh						19
	20	ls-sh: Interbedded SHALE and LIMESTONE,							HP 700psi 20

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 4 of 21 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	soft, fissile, calcite veins throughout, dark gray to black.	ls-sh						Drill action: smooth No water used Time 25 min
	22								
	23								
545	24								
	25								
	26								
	27								
	28								
540	29								
	30	ls-sh: Interbedded SHALE and LIMESTONE, soft, fissile, calcite veins throughout, dark gray			Organic Vapor				

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 5 of 21 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)
		to black.			= 0.0ppm				
	31								31
	32								32
	33								33
535	34		ls-sh						34
	35								35
	36								36
	37								37
	38	sh: SHALE, soft, fissile, calcite veins throughout, no major fractures, dark gray to black.			Organic Vapor = 0.0ppm				38 HP 500psi Drill action: smooth to slightly rough No water used, return water: black Time 25 min
530	39								39
	40								40

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 6 of 21 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	41								41
	42								42
	43		sh						43
525	44								44
	45								45
	46								46
	47								47
	48	sh: SHALE, soft, fissile, calcite veins throughout, no major fractures, dark gray to black.			Organic Vapor = 0.0ppm				48
520	49								49
	50								50

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 7 of 21 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	51								
	52								
	53		sh						
515	54								
	55								
	56								
	57								
	58	sh: SHALE, soft, fissile, calcite veins throughout, no major fractures, dark gray to black.			Organic Vapor = 0.0ppm				HP 500psi Drill action: smooth Water used: 75 gal, rec 100%, black Time 25 min
510	59								
	60								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 8 of 21 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	61								
	62								
	63		sh						
505	64								
	65								
	66								
	67								
	68	sh: SHALE, soft, fissile, calcite veins throughout, no major fractures, dark gray to black.			Organic Vapor = 0.0ppm				
500	69								
	70								
	71								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 9 of 21 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	71								
	72								
	73		sh						
495	74								
	75								
	76								
	77								
	78	sh: SHALE, soft, fissile, calcite veins throughout, dark gray to black.			Organic Vapor = 0.0ppm				HP 500psi Drill action: smooth to rough Water used: 60 gal, rec 100%, black Time 25 min
490	79								
	80								
	81								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 10 of 21 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	82								
	83		sh						
485	84								
	85								
	86								
	87								
	88	sh: SHALE, soft, fissile, calcite veins throughout, broken zone at 93', dark gray to black.			Organic Vapor = 0.0ppm				
480	89								
	90								
	91								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 11 of 21 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	92								
	93		sh						
475	94								
	95								
	96								
	97								
	98	sh: SHALE, soft, fissile, calcite veins throughout, broken zone at 99', dark gray to black.			Organic Vapor = 0.0ppm				HP 500psi Drill action: slightly rough No water used, return water: black Time 15 min
470	99								
	100								
	101								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 12 of 21 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	102								
	103		sh						
465	104								
	105								
	106								
	107								
	108	sh: SHALE, soft, fissile, calcite veins throughout, dark gray to black.			Organic Vapor = 0.0ppm				
460	109								
	110								
	111		sh						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 13 of 21 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)
455	112								112
	113								113
	114	ls-sh: Broken zone, SHALE grading to LIMESTONE.	ls-sh						114
	115								115
	116	ls: LIMESTONE, slightly to moderately hard, calcite veins, dark gray.							116
	117		ls						117
	118	ls: LIMESTONE, moderately hard to hard, calcite veins, gray to dark gray.			Organic Vapor = 0.0ppm				HP 800-1000psi Drill action: smooth No water used, return water: gray Time 120 min 118
450	119								119
	120								120
	121								121

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 14 of 21 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	122								122
	123		ls						123
445	124								124
	125								125
	126								126
	127								127
	128	ls: LIMESTONE, moderately hard to hard, calcite veins, gray to dark gray.			Organic Vapor = 0.0ppm				128
440	129								129
	130								130
	131								131

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 15 of 21 sheets

Elev. (a)	Depth (b)	Description of Materials (c)	USCS / Lithology	Graphic	Field screening results (d)	Geotech sample or core box no. (e)	Analytical sample no. (f)	Blow counts (g)	Remarks (h)
	132								132
	133		ls						133
435	134								134
	135								135
	136								136
	137								137
	138	ls: LIMESTONE, slightly to moderately hard, calcite veins, gray to dark gray.			Organic Vapor = 0.0ppm				138 HP 1000psi Drill action: smooth to slightly rough Water used: 50 gals, rec 100%, gray Time 95 min
430	139								139
	140								140 NOTE: Formation appears to be getting softer. Notice an increase in amount of water being generated.
	141								141
	142								142

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 16 of 21 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)
	143		ls						
425	144								
	145								
	146								
	147								
	148	ls: LIMESTONE, slightly to moderately hard, calcite veins, gray to dark gray.			Organic Vapor = 0.0ppm				
420	149								
	150								
	151								
	152		ls						

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 17 of 21 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)
415	153								153
	154								154
	155	ls: LIMESTONE, broken zone.	ls						NOTE: After drilling 138-158 interval and preparing to collect discrete sample, borehole started artesian flow. 155
	156								156
	157								157
	158	ls: LIMESTONE, slightly to moderately hard, calcite veins, gray to dark gray, no noticeable fractures or voids.			Organic Vapor = 0.0ppm				HP 1000psi Drill action: smooth No water used, return water: gray Time 100 min 158
410	159								159
	160								160
	161								161
	162								162

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 18 of 21 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)
405	163	ls: LIMESTONE, slightly to moderately hard, calcite veins, gray to dark gray, no noticeable fractures or voids.	ls		Organic Vapor = 0.0ppm				
	164								
	165								
	166								
	167								
	168								
400	169								
	170								
	171								
	172								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 19 of 21 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)
	173		ls						
395	174								
	175								
	176								
	177								
	178	ls: LIMESTONE, moderately hard to hard, calcite veins, gray.			Organic Vapor = 0.0ppm				HP 1000psi Drill action: slightly rough No water used, return water: gray Time 125 min
390	179								
	180								
	181								
	182								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 20 of 21 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)
	183		ls						
385	184								
	185								
	186								
	187								
	188	ls: LIMESTONE, moderately hard to hard, calcite veins, gray.			Organic Vapor = 0.0ppm				
380	189								
	190								
	191								
	192								

HTRW DRILLING LOG (Continuation Sheet)

HOLE NUMBER: RNG-203-MW25

Project: Fort McClellan | Geologist: Adam Day/Kyle Wilson | Sheet 21 of 21 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)
375	193		ls						
	194								
	195								
	196								
	197								
	198								
370	199								
	200								Bottom of borehole at 200' bgs

WELL CONSTRUCTION LOGS

MONITORING WELL INSTALLATION DETAIL

PROJECT: Fort McClellan
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Ken Gobell
SHAW FIELD REPRESENTATIVE: John Hofer

WELL NO: RNG-203-MW01
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 01-MAR-00
NORTHING: 1178057.75
EASTING: 606622.75
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 583.94

TOP of WELL CASING or RISER PIPE EL* 586.55 STICKUP 2.43

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: 1

FILTER PACK
TYPE of SAND PACK AROUND SCREEN: Sand No 1
TOP OF SAND PACK: 1.6

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* 581.74 DEPTH 2.2

BOTTOM of SCREENED INTERVAL EL* 571.74 DEPTH 12.2

BOTTOM of SUMP and WELL EL* 571.44 DEPTH 12.5

BOTTOM of BOREHOLE EL* 569.94 DEPTH 14

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Ken Gobell
SHAW FIELD REPRESENTATIVE: John Hofer

WELL NO: RNG-203-MW02
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 01-MAR-00
NORTHING: 1178219.9
EASTING: 606436.12
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 593.89

TOP of WELL CASING or RISER PIPE EL* 596.75 STICKUP 2.70

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: 1.0

FILTER PACK
TYPE of SAND PACK AROUND SCREEN: Sand No 1
TOP OF SAND PACK: 3.3

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* 588.89 DEPTH 5

BOTTOM of SCREENED INTERVAL EL* 573.89 DEPTH 20

BOTTOM of SUMP and WELL EL* 571.89 DEPTH 22

BOTTOM of BOREHOLE EL* 571.89 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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Ken Gobell
SHAW FIELD REPRESENTATIVE: John Hofer

WELL NO: RNG-203-MW03
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 07-MAR-00
NORTHING: 1178269.19
EASTING: 606493.25
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 598.26

TOP of WELL CASING or RISER PIPE EL* 601.16 STICKUP 2.7

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: 14.0

FILTER PACK
TYPE of SAND PACK AROUND SCREEN: Sand No 1
TOP OF SAND PACK: 16.6

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* 575.06 DEPTH 23.2

BOTTOM of SCREENED INTERVAL EL* 565.06 DEPTH 33.2

BOTTOM of SUMP and WELL EL* 564.76 DEPTH 33.5

BOTTOM of BOREHOLE EL* 564.76 DEPTH 33.5

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Ken Gobell
SHAW FIELD REPRESENTATIVE: John Hofer

WELL NO: RNG-203-MW04
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 02-MAR-00
NORTHING: 1178176.62
EASTING: 606330.84
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 586.73

TOP of WELL CASING or RISER PIPE
EL* 589.8 STICKUP 2.87

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: 4.5

FILTER PACK
TYPE of SAND PACK AROUND SCREEN: Sand No 1
TOP OF SAND PACK: 7.0

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* 577.73 DEPTH 9

BOTTOM of SCREENED INTERVAL
EL* 562.73 DEPTH 24

BOTTOM of SUMP and WELL
EL* 560.73 DEPTH 26

BOTTOM of BOREHOLE
EL* 560.73 DEPTH 26

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Glen Bilbrey
SHAW FIELD REPRESENTATIVE: Jonathan Remo

WELL NO: RNG-203-MW05
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 23-AUG-01
NORTHING: 1178174.77
EASTING: 606658.94
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 589

TOP of WELL CASING or RISER PIPE EL* 590.97 STICKUP 1.97

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: 11.1

FILTER PACK
TYPE of SAND PACK AROUND SCREEN: Sand No 1
TOP OF SAND PACK: 14.3

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* 569.5 DEPTH 19.5

BOTTOM of SCREENED INTERVAL EL* 559.5 DEPTH 29.5

BOTTOM of SUMP and WELL EL* 559.5 DEPTH 29.5

BOTTOM of BOREHOLE EL* 558.5 DEPTH 30.5

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Glen Bilbrey
SHAW FIELD REPRESENTATIVE: Jonathan Remo

WELL NO: RNG-203-MW06
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 18-SEP-01
NORTHING: 1177901.7
EASTING: 606516.7
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 580.02

TOP of WELL CASING or RISER PIPE EL* 582.04 STICKUP 2.02

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

APPROXIMATE DIAMETER of BOREHOLE (inches): 8

TOP OF SEAL
SEAL MATERIAL: Bentonite
SEAL START DEPTH: 2.0

FILTER PACK
TYPE of SAND PACK AROUND SCREEN: Sand No 1
TOP OF SAND PACK: 5.0

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* 570.82 DEPTH 9.2

BOTTOM of SCREENED INTERVAL EL* 555.82 DEPTH 24.2

BOTTOM of SUMP and WELL EL* 555.82 DEPTH 24.2

BOTTOM of BOREHOLE EL* 555.02 DEPTH 25

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Bruce Goodrich
SHAW FIELD REPRESENTATIVE: Jonathan Remo

WELL NO: RNG-203-MW07
DRILLING METHOD: Air Rotary
INSTALLATION DATE: 18-SEP-01
NORTHING: 1177893.44
EASTING: 606532.98
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 578.87

TOP of WELL CASING or RISER PIPE EL* 580.94 STICKUP 2.07

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

APPROXIMATE DIAMETER of BOREHOLE (inches) 12

ANNULAR SPACE SEAL TYPE
Grout
Grout

SURFACE CASING
BOTTOM of SURFACE CASING

MATERIAL	INSIDE DIAMETER	EL*	DEPTH
Steel	8	547.87	31

CASING

TYPE of RISER MATERIAL (Flush Threaded)	INSIDE DIAMETER of RISER (inches)
PVC SCH 80	4

APPROXIMATE DIAMETER of BOREHOLE (inches) 7.88

TOP OF SEAL

SEAL MATERIAL	SEAL START DEPTH
Bentonite	26.5
Sand No 0	35

SCREEN

TYPE of SCREEN MATERIAL	SLOT SIZE (inches)	INSIDE DIAMETER (inches)
PVC SCH 80	0.010	4

FILTER PACK

TYPE of SAND PACK AROUND SCREEN	TOP OF SAND PACK
Sand No 1	37

TOP OF SCREENED INTERVAL EL* 539.27 DEPTH 39.6

BOTTOM of SCREENED INTERVAL EL* 519.27 DEPTH 59.6

BOTTOM of SUMP and WELL EL* 518.87 DEPTH 60

BOTTOM of BOREHOLE EL* 515.27 DEPTH 63.6

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Glen Bilbrey
SHAW FIELD REPRESENTATIVE: Jonathan Remo

WELL NO: RNG-203-MW08
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 13-SEP-01
NORTHING: 1177825.48
EASTING: 606745.92
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 582.85

TOP of WELL CASING or RISER PIPE EL* 584.77 STICKUP 1.92

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: 7.5

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* 570.25 DEPTH 12.6

BOTTOM of SCREENED INTERVAL EL* 560.25 DEPTH 22.6

BOTTOM of SUMP and WELL EL* 560.25 DEPTH 22.6

BOTTOM of BOREHOLE EL* 560.25 DEPTH 22.6

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Bruce Goodrich
SHAW FIELD REPRESENTATIVE: Deborah Allan

WELL NO: RNG-203-MW09
DRILLING METHOD: Air Rotary
INSTALLATION DATE: 07-SEP-01
NORTHING: 1177831.94
EASTING: 606749.02
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 582.56

TOP of WELL CASING or RISER PIPE EL* 584.53 STICKUP 1.97

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

APPROXIMATE DIAMETER of BOREHOLE (inches) 12.25

ANNULAR SPACE SEAL TYPE
Grout
Grout

SURFACE CASING
BOTTOM of SURFACE CASING

MATERIAL	INSIDE DIAMETER	EL*	DEPTH
Steel	8	548.56	34

CASING

TYPE of RISER MATERIAL (Flush Threaded)	INSIDE DIAMETER of RISER (inches)
PVC SCH 80	4

APPROXIMATE DIAMETER of BOREHOLE (inches) 7.88

TOP OF SEAL

SEAL MATERIAL	SEAL START DEPTH
Bentonite	27.5
Sand No 0	37

SCREEN

TYPE of SCREEN MATERIAL	SLOT SIZE (inches)	INSIDE DIAMETER (inches)
PVC SCH 80	0.010	4

FILTER PACK

TYPE of SAND PACK AROUND SCREEN	TOP OF SAND PACK
Sand No 1	41

TOP OF SCREENED INTERVAL EL* 534.16 DEPTH 48.4

BOTTOM of SCREENED INTERVAL EL* 514.16 DEPTH 68.4

BOTTOM of SUMP and WELL EL* 514.16 DEPTH 68.4

BOTTOM of BOREHOLE EL* 514.16 DEPTH 68.4

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Glen Bilbrey
SHAW FIELD REPRESENTATIVE: Jonathan Remo

WELL NO: RNG-203-MW10
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 13-SEP-01
NORTHING: 1177815.73
EASTING: 606575.23
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 575.65

TOP of WELL CASING or RISER PIPE EL* 577.69 STICKUP 2.04

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: 3.5

FILTER PACK
TYPE of SAND PACK AROUND SCREEN: Sand No 1
TOP OF SAND PACK: 6.0

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* 566.65 DEPTH 9

BOTTOM of SCREENED INTERVAL EL* 546.65 DEPTH 29

BOTTOM of SUMP and WELL EL* 546.65 DEPTH 29

BOTTOM of BOREHOLE EL* 545.65 DEPTH 30

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Bruce Goodrich
SHAW FIELD REPRESENTATIVE: Deborah Allan

WELL NO: RNG-203-MW11
DRILLING METHOD: Air Rotary
INSTALLATION DATE: 06-SEP-01
NORTHING: 1177824.16
EASTING: 606585.7
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 575.98

TOP of WELL CASING or RISER PIPE EL* 577.99 STICKUP 2.01

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

APPROXIMATE DIAMETER of BOREHOLE (inches) 12.25

ANNULAR SPACE SEAL TYPE
Grout
Grout

SURFACE CASING
BOTTOM of SURFACE CASING

MATERIAL	INSIDE DIAMETER	EL*	DEPTH
Steel	8	543.98	32

CASING

TYPE of RISER MATERIAL (Flush Threaded)	INSIDE DIAMETER of RISER (inches)
PVC SCH 80	4

APPROXIMATE DIAMETER of BOREHOLE (inches) 7.88

TOP OF SEAL

SEAL MATERIAL	SEAL START DEPTH
Bentonite	27
Sand No 0	46

SCREEN

TYPE of SCREEN MATERIAL	SLOT SIZE (inches)	INSIDE DIAMETER (inches)
PVC SCH 80	0.010	4

FILTER PACK

TYPE of SAND PACK AROUND SCREEN	TOP OF SAND PACK
Sand No 1	47.5

TOP OF SCREENED INTERVAL EL* 526.98 DEPTH 49

BOTTOM of SCREENED INTERVAL EL* 516.98 DEPTH 59

BOTTOM of SUMP and WELL EL* 516.98 DEPTH 59

BOTTOM of BOREHOLE EL* 516.98 DEPTH 59

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Glen Bilbrey
SHAW FIELD REPRESENTATIVE: Jonathan Remo

WELL NO: RNG-203-MW12
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 18-SEP-01
NORTHING: 1177775.14
EASTING: 606363.76
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 577.08

TOP of WELL CASING or RISER PIPE EL* 578.97 STICKUP 1.89

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: 13

FILTER PACK
TYPE of SAND PACK AROUND SCREEN: Sand No 1
TOP OF SAND PACK: 16

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

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

TOP OF SCREENED INTERVAL EL* 555.08 DEPTH 22

BOTTOM of SCREENED INTERVAL EL* 540.08 DEPTH 37

BOTTOM of SUMP and WELL EL* 540.08 DEPTH 37

BOTTOM of BOREHOLE EL* 540.08 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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Bruce Goodrich
SHAW FIELD REPRESENTATIVE: Jonathan Remo

WELL NO: RNG-203-MW13
DRILLING METHOD: Air Rotary
INSTALLATION DATE: 13-SEP-01
NORTHING: 1177769.25
EASTING: 606359.91
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 576.74

TOP of WELL CASING or RISER PIPE EL* 578.85 STICKUP 2.11

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

APPROXIMATE DIAMETER of BOREHOLE (inches) 12

ANNULAR SPACE SEAL TYPE
Grout
Grout

SURFACE CASING
BOTTOM of SURFACE CASING

MATERIAL	INSIDE DIAMETER	EL*	DEPTH
Steel	8	534.74	42

CASING

TYPE of RISER MATERIAL (Flush Threaded)	INSIDE DIAMETER of RISER (inches)
PVC SCH 80	4

APPROXIMATE DIAMETER of BOREHOLE (inches) 7.88

TOP OF SEAL

SEAL MATERIAL	SEAL START DEPTH
Bentonite	33
Sand No 0	47

SCREEN

TYPE of SCREEN MATERIAL	SLOT SIZE (inches)	INSIDE DIAMETER (inches)
PVC SCH 80	0.010	4

FILTER PACK

TYPE of SAND PACK AROUND SCREEN	TOP OF SAND PACK
Sand No 1	49

TOP OF SCREENED INTERVAL EL* 524.14 DEPTH 52.6

BOTTOM of SCREENED INTERVAL EL* 504.14 DEPTH 72.6

BOTTOM of SUMP and WELL EL* 503.74 DEPTH 73

BOTTOM of BOREHOLE EL* 503.74 DEPTH 73

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Glen Bilbrey
SHAW FIELD REPRESENTATIVE: Jonathan Remo

WELL NO: RNG-203-MW14
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 23-AUG-01
NORTHING: 1178043.42
EASTING: 606097.4
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 582.37

TOP of WELL CASING or RISER PIPE EL* 584.55 STICKUP 2.18

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: 2.0

FILTER PACK
TYPE of SAND PACK AROUND SCREEN: Sand No 1
TOP OF SAND PACK: 4.0

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* 575.87 DEPTH 6.5

BOTTOM of SCREENED INTERVAL EL* 565.87 DEPTH 16.5

BOTTOM of SUMP and WELL EL* 565.87 DEPTH 16.5

BOTTOM of BOREHOLE EL* 564.87 DEPTH 17.5

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Glen Bilbrey
SHAW FIELD REPRESENTATIVE: Jonathan Remo

WELL NO: RNG-203-MW15
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 24-AUG-01
NORTHING: 1178035.31
EASTING: 606214.65
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 582.93

TOP of WELL CASING or RISER PIPE EL* 585.04 STICKUP 2.11

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: 1.6

FILTER PACK
TYPE of SAND PACK AROUND SCREEN: Sand No 1
TOP OF SAND PACK: 3.6

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* 577.03 DEPTH 5.9

BOTTOM of SCREENED INTERVAL EL* 567.03 DEPTH 15.9

BOTTOM of SUMP and WELL EL* 567.03 DEPTH 15.9

BOTTOM of BOREHOLE EL* 565.93 DEPTH 17

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Glen Bilbrey
SHAW FIELD REPRESENTATIVE: Nicole Badon

WELL NO: RNG-203-MW16
DRILLING METHOD: Hollow Stem Auger
INSTALLATION DATE: 30-AUG-02
NORTHING: 1177961.75
EASTING: 606336.06
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 589.63

TOP of WELL CASING or RISER PIPE
EL* 591.56 STICKUP 1.93

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: 12.5

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* 572.63 DEPTH 17

BOTTOM of SCREENED INTERVAL
EL* 562.63 DEPTH 27

BOTTOM of SUMP and WELL
EL* 562.63 DEPTH 27

BOTTOM of BOREHOLE
EL* 562.63 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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Stephen Keener
SHAW FIELD REPRESENTATIVE: Adam Day

WELL NO: RNG-203-MW17
DRILLING METHOD: Air Rotary
INSTALLATION DATE: 29-AUG-02
NORTHING: 1177955.87
EASTING: 606326.06
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 589.01

TOP of WELL CASING or RISER PIPE EL* 590.85 STICKUP 1.84

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

APPROXIMATE DIAMETER of BOREHOLE (inches) 12

ANNULAR SPACE SEAL TYPE
Grout
Grout

SURFACE CASING
BOTTOM of SURFACE CASING

MATERIAL	INSIDE DIAMETER	EL*	DEPTH
Steel	8	557.01	32

CASING

TYPE of RISER MATERIAL (Flush Threaded)	INSIDE DIAMETER of RISER (inches)
PVC SCH 80	4

APPROXIMATE DIAMETER of BOREHOLE (inches) 8

TOP OF SEAL

SEAL MATERIAL	SEAL START DEPTH
Bentonite	23

SCREEN

TYPE of SCREEN MATERIAL	SLOT SIZE (inches)	INSIDE DIAMETER (inches)
PVC SCH 80	0.010	4

FILTER PACK

TYPE of SAND PACK AROUND SCREEN	TOP OF SAND PACK
Sand No 1	35.5

TOP OF SCREENED INTERVAL EL* 548.81 DEPTH 40.2

BOTTOM of SCREENED INTERVAL EL* 538.81 DEPTH 50.2

BOTTOM of SUMP and WELL EL* 538.81 DEPTH 50.2

BOTTOM of BOREHOLE EL* 538.81 DEPTH 50.2

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Stephen Keener
SHAW FIELD REPRESENTATIVE: Adam Day

WELL NO: RNG-203-MW18
DRILLING METHOD: Air Rotary
INSTALLATION DATE: 03-SEP-02
NORTHING: 1177756.36
EASTING: 606375.16
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 574.69

TOP of WELL CASING or RISER PIPE EL* 576.8 STICKUP 2.11

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

APPROXIMATE DIAMETER of BOREHOLE (inches) 8

ANNULAR SPACE SEAL TYPE
Grout
Grout

SURFACE CASING
BOTTOM of SURFACE CASING

MATERIAL	INSIDE DIAMETER	EL*	DEPTH
Steel	8	558.69	16

CASING

TYPE of RISER MATERIAL (Flush Threaded)	INSIDE DIAMETER of RISER (inches)
PVC SCH 80	4

APPROXIMATE DIAMETER of BOREHOLE (inches) 7.88

TOP OF SEAL

SEAL MATERIAL	SEAL START DEPTH
Bentonite	10
Sand No 0	61.5

SCREEN

TYPE of SCREEN MATERIAL	SLOT SIZE (inches)	INSIDE DIAMETER (inches)
PVC SCH 80	0.010	4

FILTER PACK

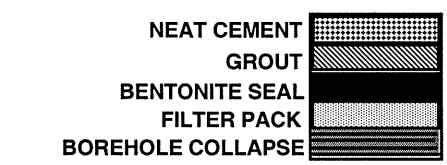
TYPE of SAND PACK AROUND SCREEN	TOP OF SAND PACK
Sand No 1	67

TOP OF SCREENED INTERVAL EL* 499.39 DEPTH 75.3

BOTTOM of SCREENED INTERVAL EL* 484.39 DEPTH 90.3

BOTTOM of SUMP and WELL EL* 484.39 DEPTH 90.3

BOTTOM of BOREHOLE EL* 483.69 DEPTH 91



*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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Stephen Keener
SHAW FIELD REPRESENTATIVE: Adam Day

WELL NO: RNG-203-MW19
DRILLING METHOD: Air Rotary
INSTALLATION DATE: 04-SEP-02
NORTHING: 1177714.96
EASTING: 606181.89
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 576.22

TOP of WELL CASING or RISER PIPE EL* 578.36 STICKUP 2.14

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	SEAL START DEPTH
Bentonite	76
Sand No 0	81

FILTER PACK

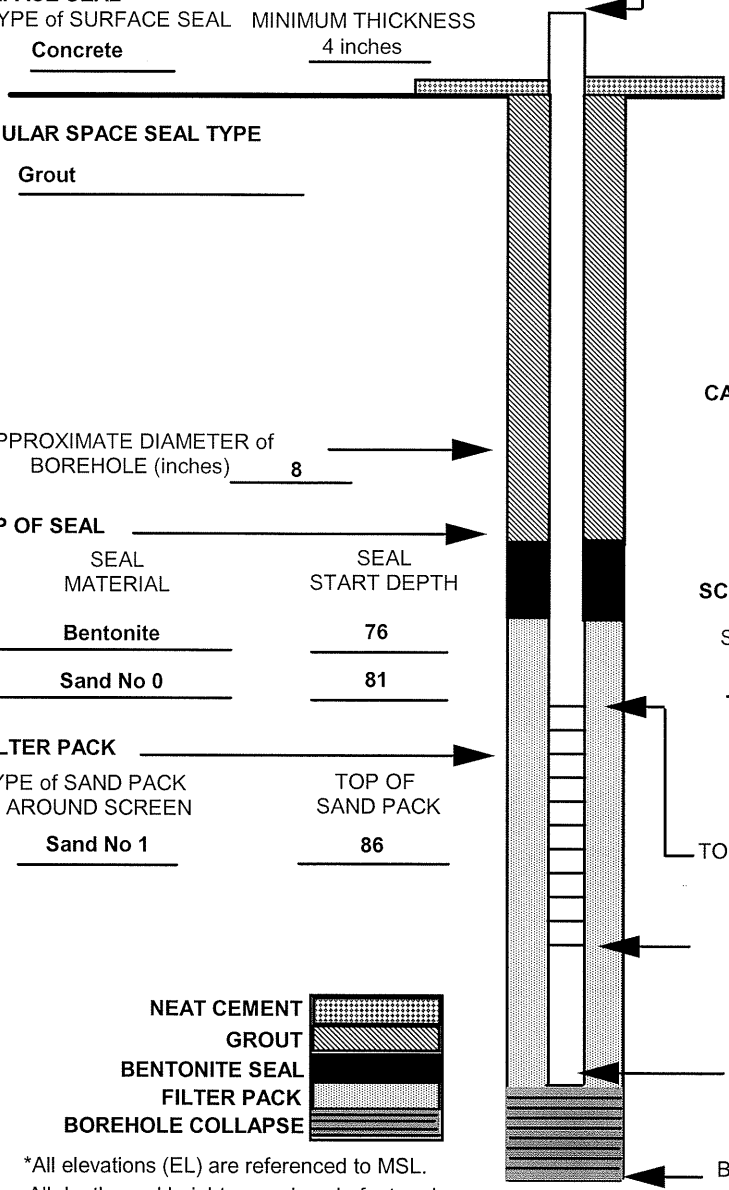
TYPE of SAND PACK AROUND SCREEN	TOP OF SAND PACK
Sand No 1	86

CASING

TYPE of RISER MATERIAL (Flush Threaded)	INSIDE DIAMETER of RISER (inches)
PVC SCH 80	4

SCREEN

TYPE of SCREEN MATERIAL	SLOT SIZE (inches)	INSIDE DIAMETER (inches)
PVC SCH 80	0.010	4



TOP OF SCREENED INTERVAL EL* 485.42 DEPTH 90.8

BOTTOM of SCREENED INTERVAL EL* 470.42 DEPTH 105.8

BOTTOM of SUMP and WELL EL* 470.42 DEPTH 105.8

BOTTOM of BOREHOLE EL* 470.12 DEPTH 106.1

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Stephen Keener
SHAW FIELD REPRESENTATIVE: Jeff Tarr

WELL NO: RNG-203-MW20
DRILLING METHOD: Air Rotary
INSTALLATION DATE: 28-AUG-02
NORTHING: 1177551.02
EASTING: 606285.51
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 569.53

TOP of WELL CASING or RISER PIPE
EL* 571.77 STICKUP 2.24

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	SEAL START DEPTH
Bentonite	16
Sand No 0	73

FILTER PACK

TYPE of SAND PACK AROUND SCREEN	TOP OF SAND PACK
Sand No 1	77.5

CASING

TYPE of RISER MATERIAL (Flush Threaded)	INSIDE DIAMETER of RISER (inches)
PVC SCH 80	4

SCREEN

TYPE of SCREEN MATERIAL	SLOT SIZE (inches)	INSIDE DIAMETER (inches)
PVC SCH 80	0.010	4

TOP OF SCREENED INTERVAL
EL* 486.03 DEPTH 83.5

BOTTOM of SCREENED INTERVAL
EL* 466.03 DEPTH 103.5

BOTTOM of SUMP and WELL
EL* 465.63 DEPTH 103.9

BOTTOM of BOREHOLE
EL* 463.73 DEPTH 105.8

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Stephen Keener
SHAW FIELD REPRESENTATIVE: Adam Day

WELL NO: RNG-203-MW21
DRILLING METHOD: Air Rotary
INSTALLATION DATE: 28-AUG-02
NORTHING: 1177624.75
EASTING: 606553.98
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 578.92

TOP of WELL CASING or RISER PIPE EL* 581.14 STICKUP 2.22

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	SEAL START DEPTH
Bentonite	16
Sand No 0	69

FILTER PACK

TYPE of SAND PACK AROUND SCREEN	TOP OF SAND PACK
Sand No 1	76

CASING

TYPE of RISER MATERIAL (Flush Threaded)	INSIDE DIAMETER of RISER (inches)
PVC SCH 80	4

SCREEN

TYPE of SCREEN MATERIAL	SLOT SIZE (inches)	INSIDE DIAMETER (inches)
PVC SCH 80	0.010	4

TOP OF SCREENED INTERVAL EL* 498.82 DEPTH 80.1

BOTTOM of SCREENED INTERVAL EL* 478.82 DEPTH 100.1

BOTTOM of SUMP and WELL EL* 478.82 DEPTH 100.1

BOTTOM of BOREHOLE EL* 477.72 DEPTH 101.2

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Mike Martin
SHAW FIELD REPRESENTATIVE: Kyle Wilson

WELL NO: RNG-203-MW22
DRILLING METHOD: Air Rotary
INSTALLATION DATE: 13-AUG-03
NORTHING: 1177566.19
EASTING: 606282.47
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 569.74

TOP of WELL CASING or RISER PIPE EL* 572.05 STICKUP 2.31

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

APPROXIMATE DIAMETER of BOREHOLE (inches) 12.25

ANNULAR SPACE SEAL TYPE
Grout
Grout

SURFACE CASING
BOTTOM of SURFACE CASING

MATERIAL	INSIDE DIAMETER	EL*	DEPTH
Steel	8	461.74	108

CASING

TYPE of RISER MATERIAL (Flush Threaded)	INSIDE DIAMETER of RISER (inches)
PVC SCH 80	2.5

APPROXIMATE DIAMETER of BOREHOLE (inches) 8

TOP OF SEAL

SEAL MATERIAL	SEAL START DEPTH
Bentonite	099
Sand No 0	172

SCREEN

TYPE of SCREEN MATERIAL	SLOT SIZE (inches)	INSIDE DIAMETER (inches)
PVC SCH 80	0.010	2.5

FILTER PACK

TYPE of SAND PACK AROUND SCREEN	TOP OF SAND PACK
Sand No 1	180

TOP OF SCREENED INTERVAL EL* 382.74 DEPTH 187

BOTTOM of SCREENED INTERVAL EL* 362.74 DEPTH 207

BOTTOM of SUMP and WELL EL* 362.74 DEPTH 207

BOTTOM of BOREHOLE EL* 359.74 DEPTH 210

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Mike Martin
SHAW FIELD REPRESENTATIVE: Kyle Wilson

WELL NO: RNG-203-MW23
DRILLING METHOD: Air Rotary
INSTALLATION DATE: 11-SEP-03
NORTHING: 1177422.41
EASTING: 606414.62
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 576.91

TOP of WELL CASING or RISER PIPE EL* 579.68 STICKUP 2.77

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

APPROXIMATE DIAMETER of BOREHOLE (inches) 12.25

ANNULAR SPACE SEAL TYPE
Grout
Grout
Grout

SURFACE CASING
BOTTOM of SURFACE CASING

MATERIAL	INSIDE DIAMETER	EL*	DEPTH
Steel	6	456.91	120
Steel	8	538.91	38

CASING
TYPE of RISER MATERIAL (Flush Threaded): PVC SCH 80
INSIDE DIAMETER of RISER (inches): 2.5

APPROXIMATE DIAMETER of BOREHOLE (inches) 6

TOP OF SEAL

SEAL MATERIAL	SEAL START DEPTH
Bentonite	115
Sand No 0	210

SCREEN

TYPE of SCREEN MATERIAL	SLOT SIZE (inches)	INSIDE DIAMETER (inches)
PVC SCH 80	0.010	2.5

FILTER PACK

TYPE of SAND PACK AROUND SCREEN	TOP OF SAND PACK
Sand No 1	215

TOP OF SCREENED INTERVAL EL* 356.91 DEPTH 220

BOTTOM of SCREENED INTERVAL EL* 336.91 DEPTH 240

BOTTOM of SUMP and WELL EL* 336.51 DEPTH 240.4

BOTTOM of BOREHOLE EL* 336.51 DEPTH 240.4

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Mike Martin
SHAW FIELD REPRESENTATIVE: Kyle Wilson

WELL NO: RNG-203-MW24
DRILLING METHOD: Air Rotary
INSTALLATION DATE: 27-AUG-03
NORTHING: 1177327.87
EASTING: 606258.23
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 569.43

TOP of WELL CASING or RISER PIPE EL* 571.73 STICKUP 2.3

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

APPROXIMATE DIAMETER of BOREHOLE (inches) 12.25

ANNULAR SPACE SEAL TYPE
Grout
Grout

SURFACE CASING
BOTTOM of SURFACE CASING

MATERIAL	INSIDE DIAMETER	EL*	DEPTH
Steel	8	555.43	14

CASING

TYPE of RISER MATERIAL (Flush Threaded)	INSIDE DIAMETER of RISER (inches)
PVC SCH 80	2.5

APPROXIMATE DIAMETER of BOREHOLE (inches) 4

TOP OF SEAL

SEAL MATERIAL	SEAL START DEPTH
Bentonite	151.6
Sand No 0	207

SCREEN

TYPE of SCREEN MATERIAL	SLOT SIZE (inches)	INSIDE DIAMETER (inches)
PVC SCH 80	0.010	2.5

FILTER PACK

TYPE of SAND PACK AROUND SCREEN	TOP OF SAND PACK
Sand No 1	212

TOP OF SCREENED INTERVAL EL* 351.43 DEPTH 218

BOTTOM of SCREENED INTERVAL EL* 331.43 DEPTH 238

BOTTOM of SUMP and WELL EL* 331.43 DEPTH 238

BOTTOM of BOREHOLE EL* 328.63 DEPTH 240.8

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
LOCATION: Anniston, AL
CLIENT: USACE Mobile District
CONTRACTOR: Miller Drilling Company
DRILLER: Mike Martin
SHAW FIELD REPRESENTATIVE: Kyle Wilson

WELL NO: RNG-203-MW25
DRILLING METHOD: Air Rotary
INSTALLATION DATE: 17-SEP-03
NORTHING: 1177501.03
EASTING: 606112.28
HORIZONTAL SURVEY DATUM: NAD83
VERTICAL SURVEY DATUM: NAVD88
JOB NO: 774645

GROUND SURFACE ELEVATION* 568.88

TOP of WELL CASING or RISER PIPE EL* 570.74 STICKUP 1.86

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

APPROXIMATE DIAMETER of BOREHOLE (inches) 12.25

ANNULAR SPACE SEAL TYPE
Grout
Grout

SURFACE CASING
BOTTOM of SURFACE CASING

MATERIAL	INSIDE DIAMETER	EL*	DEPTH
Steel	8	550.88	18

CASING

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

APPROXIMATE DIAMETER of BOREHOLE (inches) 8

TOP OF SEAL

SEAL MATERIAL	SEAL START DEPTH
Bentonite	105
Sand No 0	170

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	175

TOP OF SCREENED INTERVAL EL* 388.88 DEPTH 180

BOTTOM of SCREENED INTERVAL EL* 368.88 DEPTH 200

BOTTOM of SUMP and WELL EL* 368.88 DEPTH 200

BOTTOM of BOREHOLE EL* 368.88 DEPTH 200

NEAT CEMENT
GROUT
BENTONITE SEAL
FILTER PACK
BOREHOLE COLLAPSE

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All depths and heights are given in feet and are referenced to the ground surface.