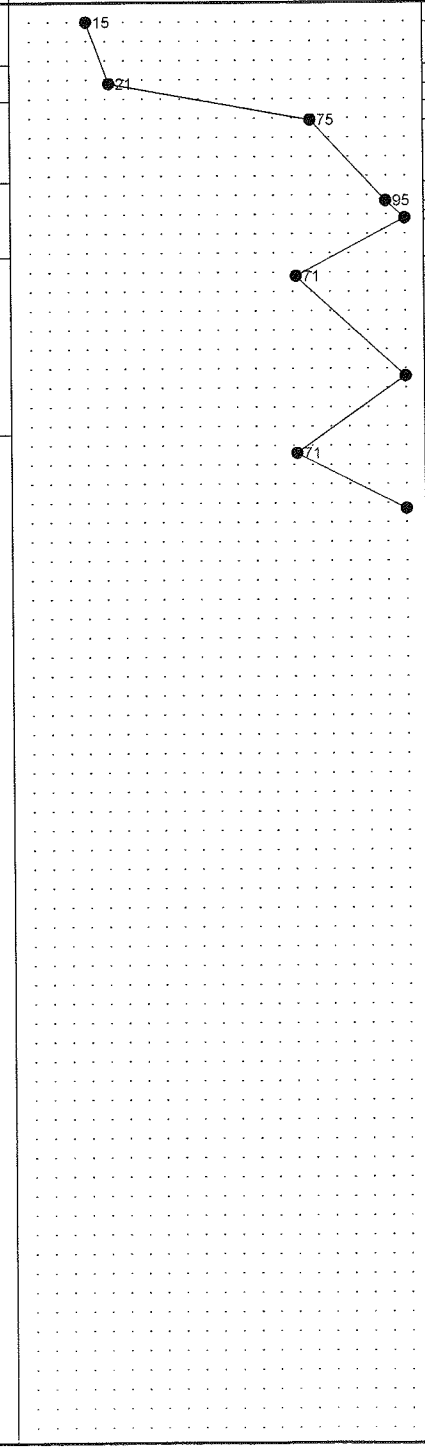
GEOTECHNICAL BORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	**COUNTY** Louisa, VA	**GEOLOGIST** J. Wallen	
SITE DESCRIPTION NORTH ANNA COL			**GROUND WATER (ft)**
BORING NO. B-918	**DRILL METHOD:** Mud Rotary/Core	**SAMPLE METHODS:** SPT/CORE	**0 HR.** 4.4
COLLAR ELEV. 272.1 ft (NAVD88)	**NORTHING** 3,910,115 US ft (NAD83)	**EASTING** 11,686,194 US ft (NAD83)	**24 HR.** 4.8
TOTAL DEPTH 150.1 ft	**DRILL MACHINE** CME 45 Trailer	**DRILLER:** D. Rhodes	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/20/06	**COMPLETED** 9/27/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
272.1								Ground Surface
272.1	0.0	15	9	6	918-1			GRAVEL (GW) grayish brown (2.5Y 5/2) dry, medium dense, well graded, fine to coarse sandy (Fill) — 1.0
268.9	3.2	10	9	12	918-2			Silty, fine to coarse SAND (SM), brownish yellow (10YR 6/6 and 6/8), moist, medium dense to very dense, relict rock fabric (Residual Soil)
267.0	5.1	22	34	41	918-3			
262.8	9.3	22	47	48	918-4			
261.3	10.8	50/0.4			918-5			261.3 — 10.8
258.9	13.2	32	34	37	918-6			Weathered Rock: Sampled as Silty, fine to medium SAND (SM), brownish yellow (10YR 6/8), moist, very dense — 12.5
253.2	18.9	50/0.5			918-7			Silty, fine to medium SAND (SM), brownish yellow (10YR 6/6), moist, very dense, relict rock fabric (Residual Soil) — 17.0
249.7	22.4	16	24	47	918-8			Weathered Rock: Sampled as Silty, fine to medium SAND (SM), brownish yellow (10YR 6/6), moist, very dense — 20.0
245.8	26.3	50/0.0			918-9			Silty, fine SAND (SM), yellowish brown (10YR 5/8), moist, very dense, relict rock fabric (Residual Soil)
								245.8 — 26.3
								Hard Rock: Dark to light gray, moderately severe to slightly weathered, close to moderately close fracturing, soft to hard, BIOTITE-QUARTZ GNEISS
								207.0 — 65.1
								Hard Rock: Light gray, fresh, moderately close to very wide fracturing, very hard, BIOTITE-QUARTZ GNEISS with trace magnetite



NORTH ANNA CO... ORE NORTH ANNA COL DATA REPORT REV0.GPJ NORTH ANNA COL.GDT 1/19/07

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	**COUNTY** Louisa, VA	**GEOLOGIST** J. Wallen	
SITE DESCRIPTION NORTH ANNA COL			**GROUND WATER (ft)**
BORING NO. B-918	**DRILL METHOD:** Mud Rotary/Core	**SAMPLE METHODS:** SPT/CORE	**0 HR.** 4.4
COLLAR ELEV. 272.1 ft (NAVD88)	**NORTHING** 3,910,115 US ft (NAD83)	**EASTING** 11,686,194 US ft (NAD83)	**24 HR.** 4.8
TOTAL DEPTH 150.1 ft	**DRILL MACHINE** CME 45 Trailer	**DRILLER:** D. Rhodes	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/20/06	**COMPLETED** 9/27/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
197.3					Continued from previous page				Hard Rock: Light gray, fresh, moderately close to very wide fracturing, very hard, BIOTITE-QUARTZ GNEISS with trace magnetite *(continued)*
167.0	105.1								Hard Rock: Light gray to gray, moderately severe to slightly weathered, very close to moderately close fracturing, medium hard to very hard, BIOTITE-QUARTZ GNEISS
157.0	115.1								Hard Rock: Light gray, slightly weathered to fresh, close to very wide fracturing, very hard, BIOTITE-QUARTZ GNEISS

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DATE STARTED 9/20/06	**COMPLETED** 9/27/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
122.5					Continued from previous page				
									122.0 — Boring and coring terminated at 150.1 ft in Hard Rock: Very hard, BIOTITE-QUARTZ GNEISS — 150.1

NORTH ANNA COL CORE NORTH ANNA COL DATA REPORT REV0.GPJ NORTH ANNA COL.GDT 1/19/07

GEOTECHNICAL CORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	**COUNTY** Louisa, VA	**GEOLOGIST** J. Wallen	
SITE DESCRIPTION NORTH ANNA COL			**GROUND WATER (ft)**
BORING NO. B-918	**DRILL METHOD:** Mud Rotary/Core	**SAMPLE METHODS:** SPT/CORE	**0 HR.** 4.4
COLLAR ELEV. 272.1 ft **(NAVD88)**	**NORTHING** 3,910,115 **US ft (NAD83)**	**EASTING** 11,686,194 **US ft (NAD83)**	**24 HR.** 4.8
TOTAL DEPTH 150.1 ft	**DRILL MACHINE** CME 45 Trailer	**DRILLER:** D. Rhodes	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/20/06	**COMPLETED** 9/27/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline	
CORE SIZE HQ3	**TOTAL RUN** 123.8 ft		

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 26.3 ft
245.8	26.3	4.0	*N=50/0.0* 7:59 5:47 0:50 7:00	(3.0) 75%	(1.5) 38%	1			245.8	Hard Rock: Dark to light gray, moderately severe to slightly weathered, close to moderately close fracturing, soft to hard, BIOTITE-QUARTZ GNEISS 26.3 (4 joints at 60°; 3 joints at 45°)
241.8	30.3									
239.8	32.3	2.0	10:04 12:40	(1.9) 95%	(1.3) 65%	UC-31.7'				(3 joints at 60° with Fe stain)
237.0	35.1	2.8	5:54 5:45 7:45/0.8	(2.6) 93%	(2.6) 93%	3				(1 joint at 60°; Quartz vein from 33.5-33.6 ft)
231.9	40.2	5.1	6:21 4:47 4:13 1:48 3:51/1.1	(5.0) 98%	(4.7) 92%	UCS-37.1'				(1 joint at 60°, 3 joints at 40°, 1 joint at 20°)
226.9	45.2	5.0	3:44 3:12 3:48 3:13 3:40	(5.0) 100%	(5.0) 100%	5				(1 joint at 60°; Quartz vein from 44.7-45.2 ft)
221.9	50.2	5.0	2:52 2:56 2:34 2:42 3:00	(5.0) 100%	(4.7) 94%	6				(3 joints at 70°; Quartz+K-feldspar+biotite vein at 70° from 48.4-49.0 ft)
216.9	55.2	5.0	2:33 2:21 2:21 2:18 1:55	(5.0) 100%	(5.0) 100%	UC-51.6'				(1 joint at 70°, 1 joint at 55°)
211.9	60.2	5.0	1:53 1:50 1:38 1:42 2:15	(5.0) 100%	(4.2) 84%	8				(5 joints at 50°, 1 joint at 70°)
207.0	65.1	4.9	4:24 3:13 3:43 3:48 3:57/0.9	(4.9) 100%	(4.9) 100%	UC-60.7'				(2 joints at 20°, 1 joint at 50°)
205.9	66.2	1.1	4:24/1.1	(1.1) 100%	(1.1) 100%	10			207.0	65.1 Hard Rock: Light gray, fresh, moderately close to very wide fracturing, very hard, BIOTITE-QUARTZ GNEISS with trace magnetite
201.9	70.2	4.0	4:02 4:20 4:52 6:33	(4.0) 100%	(4.0) 100%	11				-No Joints (1 joint at 50°)
196.9	75.2	5.0	5:53 12:48 35:12 2:28 3:05	(5.0) 100%	(5.0) 100%	12				(2 joints at 75°)
191.9	80.2	5.0	2:51 3:22 3:41 3:57 4:18	(5.0) 100%	(5.0) 100%	13				-No Joints
187.0	85.1	4.9	4:08 6:33 8:08 13:19 7:05/0.9	(4.9) 100%	(4.9) 100%	14				-No Joints
182.0	90.1	5.0	5:37 4:46 4:17 4:08 4:41	(5.0) 100%	(5.0) 100%	UCS-88.1'				(1 joint at 20°)
177.0	95.1	5.0	6:28 9:42 9:11 13:39 6:17	(5.0) 100%	(5.0) 100%	16				(1 joint at 40°; Quartz vein from 96.1-97.1 ft with trace pyrite)
172.0	100.1	5.0	9:21 10:14 12:12 8:10 8:23	(5.0) 100%	(5.0) 100%	17				-No Joints
		5.0	14:03	(5.0)	(5.0)	18				(1 joint at 10°)

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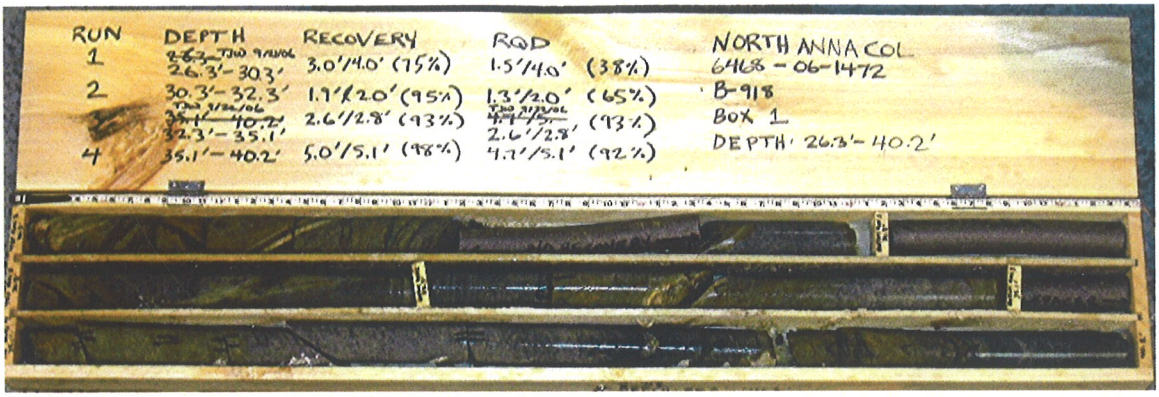
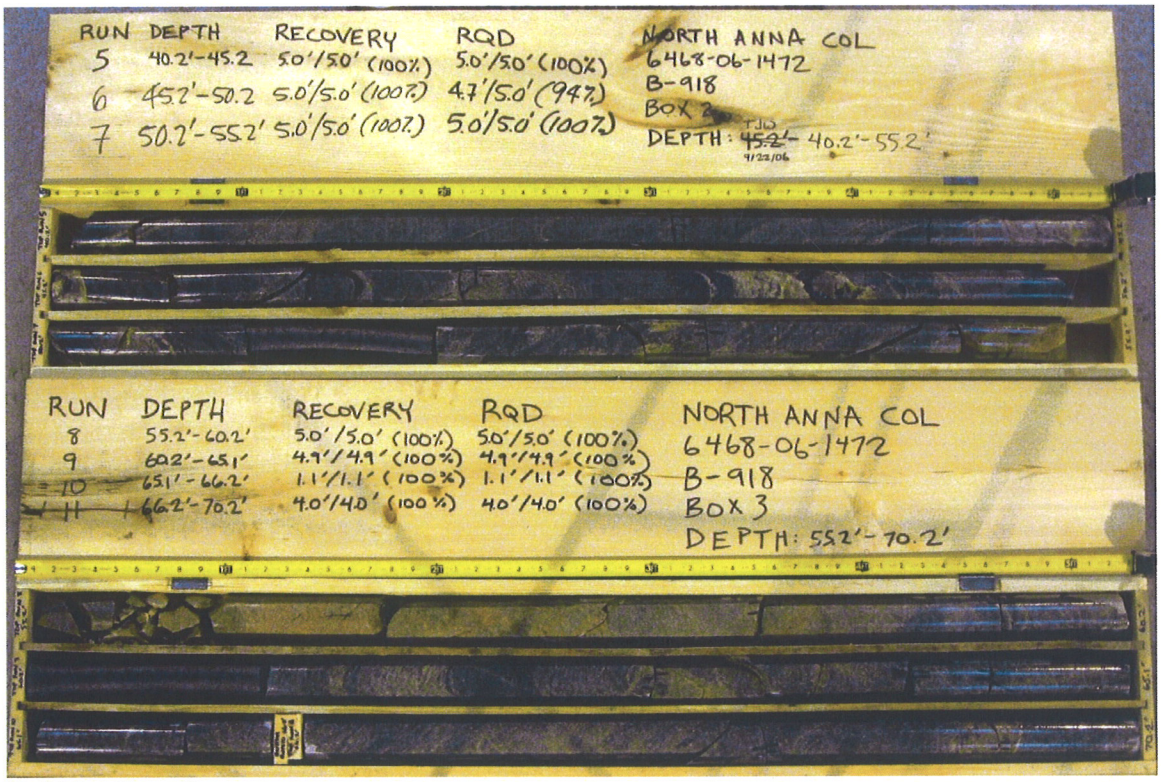
TOTAL DEPTH 150.1 ft	**DRILL MACHINE** CME 45 Trailer	**DRILLER:** D. Rhodes	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/20/06	**COMPLETED** 9/27/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline	
CORE SIZE HQ3	**TOTAL RUN** 123.8 ft		

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
			8:59 14:24 23:56 8:00	100%	100%					Hard Rock: Light gray, fresh, moderately close to very wide fracturing, very hard, BIOTITE-QUARTZ GNEISS with trace magnetite *(continued)*
167.0	105.1									167.0 — 105.1
		5.0	7:19 7:03 12:11 15:59 12:44	(5.0) 100%	(4.0) 80%	19				Hard Rock: Light gray to gray, moderately severe to slightly weathered, very close to moderately close fracturing, medium hard to very hard, BIOTITE-QUARTZ GNEISS (8 joints at 30°)
162.0	110.1									
		5.0	4:46 2:46 3:01 3:30 3:51	(4.9) 98%	(1.6) 32%	20				(13 joints at 30°; 2 joints at 70°)
157.0	115.1									157.0 — 115.1
		5.0	4:15 4:33 5:14 4:41 4:48	(5.0) 100%	(5.0) 100%	21				Hard Rock: Light gray, slightly weathered to fresh, close to very wide fracturing, very hard, BIOTITE-QUARTZ GNEISS (1 joint at 70°)
152.0	120.1									
		4.9	4:49 5:10 5:11 5:58 3:22/0.9	(4.9) 100%	(4.9) 100%	UC-122.0'				-No Joints
147.1	125.0									
		5.1	6:16 4:34 4:55 3:12 8:20/1.1	(5.1) 100%	(5.0) 98%	23				(3 joints at 30°)
142.0	130.1									
		5.0	4:59 3:59 3:29 3:28 2:50	(5.0) 100%	(4.4) 88%	24				(2 joints at 60°; 3 joints at 20-30°)
137.0	135.1									
		5.0	3:51 3:41 3:41 4:25 5:39	(5.0) 100%	(5.0) 100%	25				(Quartz+K-feldspar vein at 60° from 136.0-136.1 ft)
132.0	140.1									
		5.0	7:31 9:54 6:42 6:44 8:40	(5.0) 100%	(5.0) 100%	26				-No Joints
127.0	145.1									
		5.0	4:51 5:36 6:32 8:23 9:19	(5.0) 100%	(5.0) 100%	27				-No Joints
122.0	150.1									122.0 — 150.1
										Coring terminated at 150.1 ft in Hard Rock: Very hard, BIOTITE-QUARTZ GNEISS

NORTH ANNA COL_CORE NORTH ANNA COL DATA REPORT REV0.GPJ NORTH ANNA COL.GDT 1/19/07



B-918 – Box 1



B-918 – Box 2
B-918 – Box 3

B-918 – Box 4
B-918 – Box 5

B-918 – Box 6
B-918 – Box 7

B-918 – Box 8
B-918 – Box 9