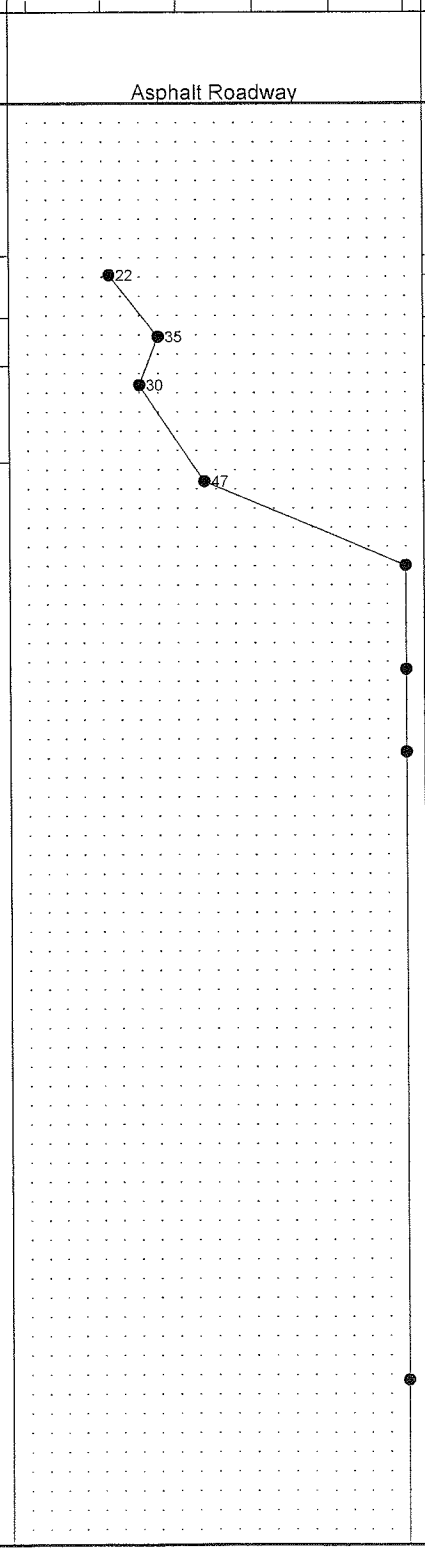
GEOTECHNICAL BORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	COUNTY Louisa, VA	GEOLOGIST S. Nicely
SITE DESCRIPTION NORTH ANNA COL		GROUND WATER (ft)
BORING NO. B-903	DRILL METHOD: Mud Rotary/Core	SAMPLE METHODS: SPT/CORE	0 HR. 15.6
COLLAR ELEV. 301.6 ft (NAVD88)	NORTHING 3,909,812 US ft (NAD83)	EASTING 11,686,029 US ft (NAD83)	24 HR. 16.8
TOTAL DEPTH 151.0 ft	DRILL MACHINE CME 55 Truck	DRILLER: H. Meyerson	HAMMER TYPE 140 lbs Auto
DATE STARTED 11/7/06	COMPLETED 11/9/06	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
301.6								Asphalt Roadway (301.6 – 0.0)
293.7	7.9							No sampling from 0.0 to 7.9 ft due to utility clearance operations (vac. track) (293.7 – 7.9)
290.5	11.1	10	8	14	903-1			Silty, fine to medium SAND (SM), pale yellow (2.5Y 7/4 & 5Y 7/3) and white (10YR 8/1), dry to moist, medium dense to dense (Residual Soil)
288.0	13.6	11	17	18	903-2			
283.0	18.6	12	16	14	903-3			
277.9	23.7	13	21	26	903-4			
273.0	28.6	50/0.3			903-5			Weathered Rock: Light gray (5Y 7/2) to brownish yellow (10YR 6/6), moist, very dense, weathered, BIOTITE-QUARTZ GNEISS (280.6 – 21.0; 267.9 – 33.7)
268.0	33.6	22	50/0.3		903-6			
235.6	66.0	50/0.1			903-7			Hard Rock: Yellowish brown, moderate severely weathered, very closely to closely fractured, soft to medium hard, BIOTITE-QUARTZ GNEISS (265.6 – 36.0)
		50/0.3			903-8			Hard Rock-Weathered Rock: Yellowish brown, gray, tan, reddish brown, and dark green, very severely to moderately weathered, very closely to closely fractured, very soft to hard, BIOTITE-QUARTZ GNEISS

BLOWS PER FOOT (0, 20, 40, 60, 80, 100)



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

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SITE DESCRIPTION NORTH ANNA COL		GROUND WATER (ft)
BORING NO. B-903	DRILL METHOD: Mud Rotary/Core	SAMPLE METHODS: SPT/CORE
COLLAR ELEV. 301.6 ft (NAVD88)	NORTHING 3,909,812 US ft (NAD83)	EASTING 11,686,029 US ft (NAD83)
TOTAL DEPTH 151.0 ft	DRILL MACHINE CME 55 Truck	DRILLER: H. Meyerson
DATE STARTED 11/7/06	COMPLETED 11/9/06	CORE BARREL TYPE: HQ 3 triple tube-wireline

GROUND WATER (ft)	
0 HR.	15.6
24 HR.	16.8

HAMMER TYPE 140 lbs Auto

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
226.8					Continued from previous page				
225.6	76.0	50/0.1				903-9			Hard Rock-Weathered Rock: Yellowish brown, gray, tan, reddish brown, and dark green, very severely to moderately weathered, very closely to closely fractured, very soft to hard, BIOTITE-QUARTZ GNEISS *(continued)*
									220.8 — 80.8
									Hard Rock: Reddish brown and gray, moderate severely to slightly weathered, very closely to closely fractured, soft to very hard, BIOTITE-QUARTZ GNEISS
									185.6 — 116.0
									Hard Rock: Gray with reddish brown, slightly weathered to fresh, very closely to widely fractured, very hard, BIOTITE-QUARTZ GNEISS

GEOTECHNICAL BORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	COUNTY Louisa, VA	GEOLOGIST S. Nicely	
SITE DESCRIPTION NORTH ANNA COL			GROUND WATER (ft)
BORING NO. B-903	DRILL METHOD: Mud Rotary/Core	SAMPLE METHODS: SPT/CORE	0 HR. 15.6
COLLAR ELEV. 301.6 ft (NAVD88)	NORTHING 3,909,812 US ft (NAD83)	EASTING 11,686,029 US ft (NAD83)	24 HR. 16.8
TOTAL DEPTH 151.0 ft	DRILL MACHINE CME 55 Truck	DRILLER: H. Meyerson	HAMMER TYPE 140 lbs Auto
DATE STARTED 11/7/06	COMPLETED 11/9/06	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
152.0					Continued from previous page				
									150.6 151.0
									Boring and coring terminated at 151.0 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

GEOTECHNICAL CORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	**COUNTY** Louisa, VA	**GEOLOGIST** S. Nicely
SITE DESCRIPTION NORTH ANNA COL		**GROUND WATER (ft)**
BORING NO. B-903	**DRILL METHOD:** Mud Rotary/Core	**SAMPLE METHODS:** SPT/CORE — **0 HR.** 15.6
COLLAR ELEV. 301.6 ft **(NAVD88)**	**NORTHING** 3,909,812 US ft (NAD83)	**EASTING** 11,686,029 US ft (NAD83) — **24 HR.** 16.8
TOTAL DEPTH 151.0 ft	**DRILL MACHINE** CME 55 Truck	**DRILLER:** H. Meyerson — **HAMMER TYPE** 140 lbs Auto
DATE STARTED 11/7/06	**COMPLETED** 11/9/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline
CORE SIZE HQ3	**TOTAL RUN** 116.9 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 @ 33.7 ft
267.9	33.7	2.3	2:20	(2.3)	(0.8)	1				267.9 — Hard Rock: Yellowish brown, moderate severely weathered, very closely to closely fractured, soft to medium hard, BIOTITE-QUARTZ GNEISS (33.7)
265.6	36.0		1:49	100%	35%					265.6 — -Highly fractured throughout run (36.0)
		5.0	0:14/0.3	(1.7)	(0.0)	2				Hard Rock-Weathered Rock: Yellowish brown, gray, tan, reddish brown, and dark green, very severely to moderately weathered, very closely to closely fractured, very soft to hard, BIOTITE-QUARTZ GNEISS
			0:53	34%	0%					
			1:09							
			1:15							
			1:36							
260.6	41.0		1:33							-Highly fractured throughout run; no recovery from 36.0-39.3 ft
		5.0	3:41	(2.9)	(0.5)	3				-Highly fractured throughout run; no recovery from 42.0-44.2 ft
			1:23	58%	10%					
			1:16							
			2:16							
255.6	46.0		4:07							
		5.0	1:55	(3.2)	(0.0)	4				-Highly fractured throughout run; no recovery from 46.0-47.8 ft
			2:02	64%	0%					
			2:44							
			6:38							
250.6	51.0		5:39							
		5.0	2:53	(3.2)	(0.0)	5				-Highly fractured throughout run; quartz vein from 53.2-53.9 ft
			4:40	64%	0%					
			4:34							
			6:00							
245.6	56.0		6:26							
		5.0	3:58	(2.6)	(0.0)	6				-Highly fractured throughout run with Fe staining and clay seams
			3:32	52%	0%					
			4:08							
			6:40							
240.6	61.0		2:15							
		5.0	2:10	(0.5)	(0.0)	7				-Very poor recovery
			2:15	10%	0%					
			5:10							
			4:15							
235.6	66.0		6:34							
235.3	66.3	4.7	N=50/0.3	(3.1)	(0.4)	903-8				-Highly fractured throughout run with Fe staining and clay on joint surfaces; no recovery from 68.1-69.6 ft
			4:04	66%	9%	8				
			3:27							
			1:26							
			4:20							
230.6	71.0		6:23/0.7							
		5.0	1:31	(1.1)	(0.0)	9				-Very poor recovery, highly fractured
			1:32	22%	0%					
			5:35							
			10:34							
225.6	76.0		3:23							
225.5	76.1	4.7	N=50/0.1	(2.5)	(0.6)	903-9				-Highly fractured throughout run with Fe staining and clay seams; no rrecovery from 76.1-78.6 ft
			2:07	53%	13%	10				
			2:35							
			4:11							
220.8	80.8		4:54							220.8 — (80.8)
		5.2	7:21/0.7	(5.1)	(4.6)	11				Hard Rock: Reddish brown and gray, moderate severely to slightly weathered, very closely to closely fractured, soft to very hard, BIOTITE-QUARTZ GNEISS (3 joints at 60-65°, 2 joints at30-40°, and 2 joints at 20-30° all with Fe staining; quartz veins at 85.4 ft, and 83.2-83.4 ft, and vugs)
			2:19	98%	88%					
			2:35							
			2:31							
			2:27							
215.6	86.0		2:49/1.2							
		5.0	2:16	(4.8)	(2.0)	12				-Highly fractured throughout run with Fe staining
			2:17	96%	40%					
			1:57							
			2:10							
210.6	91.0		2:52							
		5.0	2:54	(5.0)	(4.9)	13				(2 joints at 40-50°and 2 joints at 20-30° with Fe staining and trace clay)
			2:21	100%	98%					
			2:38							
			2:41							
205.6	96.0		2:46							
		5.0	2:36	(5.0)	(4.8)	14				(4 joints at 70°, 1 joint at 30°, and 1 joint at 45° all with Fe staining)
			2:17	100%	96%					
			2:26							
			2:57							
200.6	101.0		3:06							
		5.0	6:05	(4.5)	(3.0)	15				-Highly fractured and weathered from 101.8-101.9 ft and 103.7-104.0 ft; 1 joint at 45° with clay
			2:51	90%	60%					
			4:29							
			3:33							
195.6	106.0		2:34							
		5.0	3:24	(5.0)	(3.4)	16				-Highly fractured throughout run
			3:01	100%	68%					

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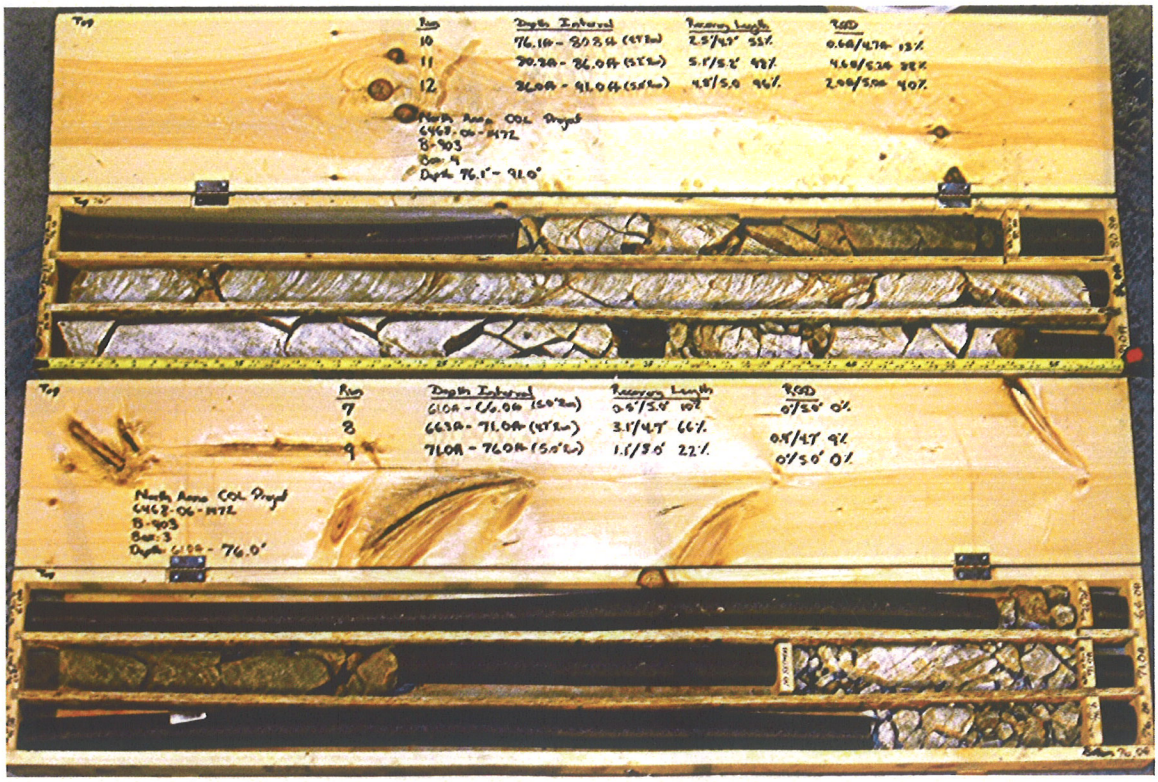
COLLAR ELEV. 301.6 ft (NAVD88)	NORTHING 3,909,812 US ft (NAD83)	EASTING 11,686,029 US ft (NAD83)	24 HR. 16.8
TOTAL DEPTH 151.0 ft	DRILL MACHINE CME 55 Truck	DRILLER: H. Meyerson	HAMMER TYPE 140 lbs Auto
DATE STARTED 11/7/06	COMPLETED 11/9/06	CORE BARREL TYPE: HQ 3 triple tube-wireline	
CORE SIZE HQ3	TOTAL RUN 116.9 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
190.6	111.0		2:31 2:28 2:07							Hard Rock: Reddish brown and gray, moderate severely to slightly weathered, very closely to closely fractured, soft to very hard, BIOTITE-QUARTZ GNEISS *(continued)* (5 joints at 20-30°, 2 joints at 70-80°, and 1 joint at 10° all with Fe staining)
185.6	116.0	5.0	1:57 1:51 1:47 2:13 2:02	(4.8) 96%	(4.3) 86%	17				185.6 — 116.0
180.6	121.0	5.0	2:23 2:46 3:13 3:04 3:09	(5.0) 100%	(4.9) 98%	18				Hard Rock: Gray with reddish brown, slightly weathered to fresh, very closely to widely fractured, very hard, BIOTITE-QUARTZ GNEISS (4 joints at 20-30° and 2 joints at 40-50° with Fe stain and trace clay)
175.6	126.0	5.0	3:32 3:39 3:34 3:59 3:46	(5.0) 100%	(5.0) 100%	19				(1 joint at 45° with Fe staining)
170.6	131.0	5.0	3:27 5:41 5:03 6:56 8:31	(5.0) 100%	(5.0) 100%	20				-Quartz vein from 126.8-128.9 ft, no joints
169.2	132.4	1.4	9:49 6:31/0.4	(1.4) 100%	(1.4) 100%	21				-No joints
165.6	136.0	3.6	2:26/0.6 4:17 4:01 4:37	(3.6) 100%	(3.5) 97%	22				(1 joint at 20°; quartz vein at 135.2-136.0 ft; plagioclase veins at 133.4 ft and 133.9 ft)
160.6	141.0	5.0	4:27 3:37 6:08 7:05 7:12	(4.9) 98%	(4.9) 98%	23				-0.1 ft diameter quartz vug at 139.0 ft
155.6	146.0	5.0	4:19 4:28 6:22 4:14 3:59	(5.1) 102%	(5.1) 102%	24				-No Joints
150.6	151.0	5.0	4:59 4:00 4:39 4:52 5:09	(5.0) 100%	(5.0) 100%	25				-No Joints; several small (<0.1 ft) quartz veins at 148.0 ft, 148.3 ft, and 149.5 ft 150.6 — 151.0
										Coring terminated at 151.0 ft in Hard Rock: Very hard, BIOTITE-QUARTZ GNEISS

B-903 – Box 1
B-903 – Box 2



B-903 – Box 4
B-903 – Box 3

B-903 – Box 6
B-903 – Box 5

B-903 – Box 7
B-903 – Box 8