GEOTECHNICAL BORING LOG

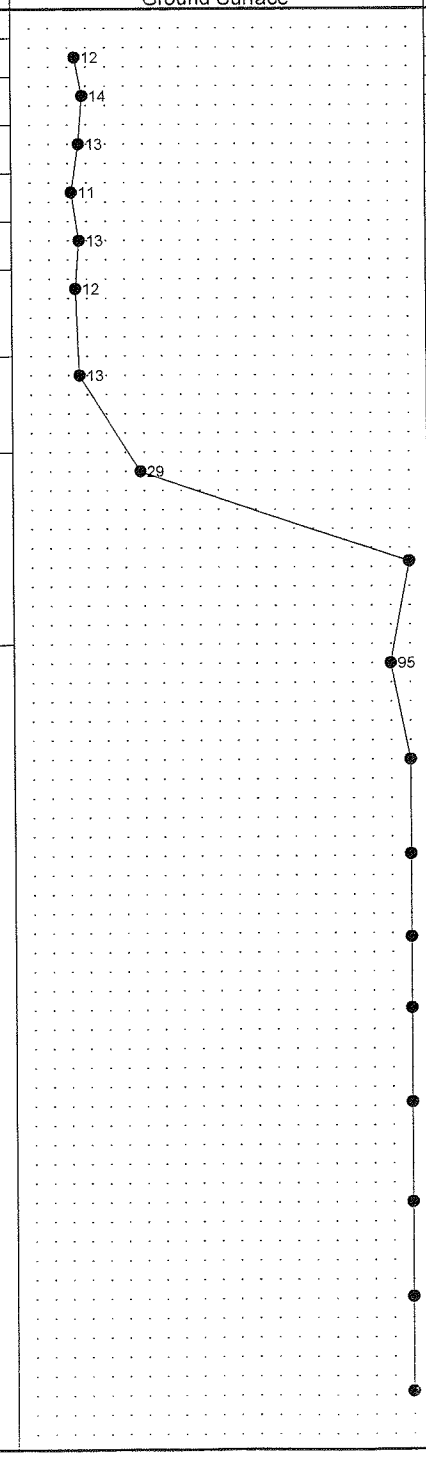
MACTEC

MACTEC PROJECT NO.: 6468-06-1472	COUNTY Louisa, VA	GEOLOGIST S.Lehman
SITE DESCRIPTION NORTH ANNA COL		GROUND WATER (ft)
BORING NO. B-904	DRILL METHOD: Rotary Wash/Core	SAMPLE METHODS: SPT/CORE
COLLAR ELEV. 316.8 ft (NAVD88)	NORTHING 3,909,692 US ft (NAD83)	EASTING 11,685,970 US ft (NAD83)
TOTAL DEPTH 151.7 ft	DRILL MACHINE CME 55LC Track	DRILLER: D. White
DATE STARTED 9/19/06	COMPLETED 9/22/06	CORE BARREL TYPE: HQ 3 triple tube-wireline

GROUND WATER (ft)	
0 HR.	22.3
24 HR.	22.7

HAMMER TYPE 140 lbs Auto

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	SAMP. NO.	SOIL AND ROCK DESCRIPTION
316.8						Ground Surface
315.3	1.5					
313.3	3.5	3	5	7	904-1	Clayey SILT (ML), strong brown (7.5YR 4/6), moist, stiff, trace sand
310.8	6.0	4	7	7	904-2	Silty, fine SAND (SM), yellowish brown (10YR 5/8), light olive brown (2.5Y 5/6), olive brown (2.5Y 4/3), and dark olive brown (2.5Y 3/3), dry to moist, medium dense, clayey, micaceous,relict rock fabric (Residual Soil)
308.3	8.5	4	7	6	904-3	
305.8	11.0	4	5	6	904-4	
303.3	13.5	4	6	7	904-5	
298.8	18.0	4	6	6	904-6	
293.8	23.0	4	5	8	904-7	Sandy SILT (ML), dark olive brown (2.5Y 3/3), moist, very stiff, micaceous, relict rock fabric (Residual Soil)
288.8	28.0	5	7	22	904-8	
283.8	33.0	31	50/0.2		904-9	Weathered Rock: Strong brown (7.5YR 4/6), olive brown (2.5Y 4/6), dark greenish gray (GLEY1 4/5G), yellowish brown (10YR 5/6), and dark grayish brown (2.5Y 4/2), sampled as moist to wet, very dense, silty fine to medium SAND (SM) and hard, sandy SILT (ML)-severely weathered, QUARTZ GNEISS
278.8	38.0	40	46	49	904-10	
273.8	43.0	16	50/0.5		904-11	
268.8	48.0	29	50/0.4		904-12	
265.1	51.7	50/0.2			904-13	
260.1	56.7	50/0.2			904-14	
255.1	61.7	50/0.1			904-15	
250.1	66.7	50/0.3			904-16	
245.1	71.7	50/0.2			904-17	
		50/0.1			904-18	



MOI

LOG

Depth (ft)	Elev. (ft)
0.0	316.8
3.0	313.8
21.0	295.8
28.5	288.3
71.8	245.0

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

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DATE STARTED 9/19/06	COMPLETED 9/22/06	CORE BARREL TYPE: HQ 3 triple tube-wireline

GROUND WATER (ft)	
0 HR.	22.3
24 HR.	22.7

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
241.9					Continued from previous page				
									240.1 — 76.7 Hard Rock: Light to dark gray with orange Fe staining, moderately severe to moderately weathered, closely fractured, medium to moderately hard, QUARTZ-BIOTITE GNEISS *(continued)*
									237.6 — 79.2 Weathered Rock: No recovery-QUARTZ-BIOTITE GNEISS
									Hard Rock: Light to dark gray with orange Fe staining, moderately to slightly weathered, close to moderately close fracturing, moderately hard to hard, QUARTZ GNEISS with biotite
									205.1 — 111.7 Hard Rock: Light to dark gray, moderately weathered to fresh, close to wide fracturing, moderately hard to hard, QUARTZ-BIOTITE GNEISS with trace pyrite

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GROUND WATER (ft)	
0 HR.	22.3
24 HR.	22.7

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
167.1					Continued from previous page				
									165.1 151.7
									Boring and coring terminated at 151.7 ft in Hard Rock: Hard QUARTZ-BIOTITE GNEISS

GEOTECHNICAL CORING LOG

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MACTEC PROJECT NO.: 6468-06-1472	COUNTY Louisa, VA	GEOLOGIST S.Lehman	
SITE DESCRIPTION NORTH ANNA COL			GROUND WATER (ft)
BORING NO. B-904	DRILL METHOD: Rotary Wash/Core	SAMPLE METHODS: SPT/CORE	0 HR. 22.3
COLLAR ELEV. 316.8 ft (NAVD88)	NORTHING 3,909,692 US ft (NAD83)	EASTING 11,685,970 US ft (NAD83)	24 HR. 22.7
TOTAL DEPTH 151.7 ft	DRILL MACHINE CME 55LC Track	DRILLER: D. White	HAMMER TYPE 140 lbs Auto
DATE STARTED 9/19/06	COMPLETED 9/22/06	CORE BARREL TYPE: HQ 3 triple tube-wireline	
CORE SIZE HQ3	TOTAL RUN 102.6 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 @ 48.2 ft
268.6 / 265.1	48.2 / 51.7	3.5	2:02 2:02 2:05 0:46/0.5 N=50/0.2	(0.0) 0%	(0.0) 0%	1				Weathered Rock: Strong brown (7.5YR 4/6), olive brown (2.5Y 4/6), dark greenish gray (GLEY1 4/5G), yellowish brown (10YR 5/6), and dark grayish brown (2.5Y 4/2), sampled as moist to wet, very dense, silty fine to medium SAND (SM) and hard, sandy SILT (ML)-severely weathered, QUARTZ GNEISS *(continued)*
264.9 / 260.1	51.9 / 56.7	4.8	1:43/0.8 2:00 2:11 2:01 1:46 N=50/0.1	(0.0) 0%	(0.0) 0%	904-14 2				-No Recovery -No Recovery
260.0 / 255.1	56.8 / 61.7	4.9	2:05 1:41 1:18 1:35 2:04/0.9 N=50/0.3	(0.0) 0%	(0.0) 0%	904-15 3				-No Recovery
254.8 / 250.1	62.0 / 66.7	4.7	1:25 1:20 1:40 2:09 2:24/0.7 N=50/0.2	(0.2) 4%	(0.0) 0%	904-16 4				-Recovered 0.2 ft of Hard Rock: Light Brownish gray, moderately severe weathering, moderately hard, QUARTZ GNEISS with biotite
249.9 / 245.1	66.9 / 71.7	4.8	2:21 2:13 2:07 2:01 2:32/0.8 N=50/0.1	(0.0) 0%	(0.0) 0%	904-17 5				-No Recovery 245.0 — 71.8
245.0 / 240.1	71.8 / 76.7	4.9	1:55 2:40 2:46 2:42 1:53/0.9	(3.5) 71%	(2.1) 43%	904-18 6				Hard Rock: Light to dark gray with orange Fe staining, moderately severe to moderately weathered, closely fractured, medium to moderately hard, QUARTZ-BIOTITE GNEISS (1 joint at 60°, 2 joints at 45°, and 2 joints at 20°-all weathered with Fe staining) 240.1 — 76.7
237.6	79.2	2.5	1:37 4:08 2:55/0.5	(0.0) 0%	(0.0) 0%	7				Weathered Rock: No recovery-QUARTZ-BIOTITE GNEISS -No Recovery 237.6 — 79.2
235.1	81.7	2.5	1:18/0.5 2:12 2:21 3:02 3:29 3:03	(2.5) 100%	(1.3) 52%	8				Hard Rock: Light to dark gray with orange Fe staining, moderately to slightly weathered, close to moderately close fracturing, moderately hard to hard, QUARTZ GNEISS with biotite (1 joint at 60° with clay; 2 joints at 45° and 2 joints at 20° with weathering and Fe staining) (1 joint at 60° weathered with Fe staining; 2 joints at 30° weathered with Fe stain; 1 joint at 20° with slight weathering)
230.1	86.7	5.0	3:27 3:33 3:01 3:35 3:20 3:29	(5.0) 100%	(4.2) 84%	9				(1 joint at 45° and 5 joints at 20° all slightly weathered and Fe stained)
225.1	91.7	5.0	3:17 2:29 2:37 2:41 2:38 2:26	(5.0) 100%	(3.9) 78%	10				(1 joint at 60°, 1 joint at 45°, and 1 joint at 30° -all with weathering and Fe staining)
220.1	96.7	5.0	2:40 2:22 2:39 2:36 2:26	(4.8) 96%	(4.8) 96%	11				(1 joint at 75°, 2 joints at 60°, and 2 joints at 30° -all with weathering and Fe staining)
215.1	101.7	5.0	2:29 2:58 3:18 3:03 3:11	(4.8) 96%	(4.0) 80%	12				(2 joints at 60°, 1 joint at 30°, and 1 joint at 20° -all with weathering and Fe stain)
210.1	106.7	5.0	3:09 2:32 2:33 2:34 2:31	(4.6) 92%	(4.3) 86%	13				(2 joints at 70° slightly weathered, trace clay and Fe staining) 205.1 — 111.7
205.1	111.7	5.0	2:37 2:10 2:01 3:13 2:44	(5.0) 100%	(5.0) 100%	14				Hard Rock: Light to dark gray, moderately weathered to fresh, close to wide fracturing, moderately hard to hard, QUARTZ-BIOTITE GNEISS with trace pyrite (2 joints at 45° weathered and Fe stained)
200.1	116.7	5.0	2:11 2:13 2:15 2:30 2:13	(4.0) 80%	(3.8) 76%	15				(1 joint at 45° and 1 joint at 30° with weathering and Fe staining)
195.1	121.7	5.0	2:14	(4.3) 86%	(3.9) 78%	16				(2 joints at 45° with weathering and Fe staining)
				(5.0)	(4.7)	17				

GEOTECHNICAL CORING LOG

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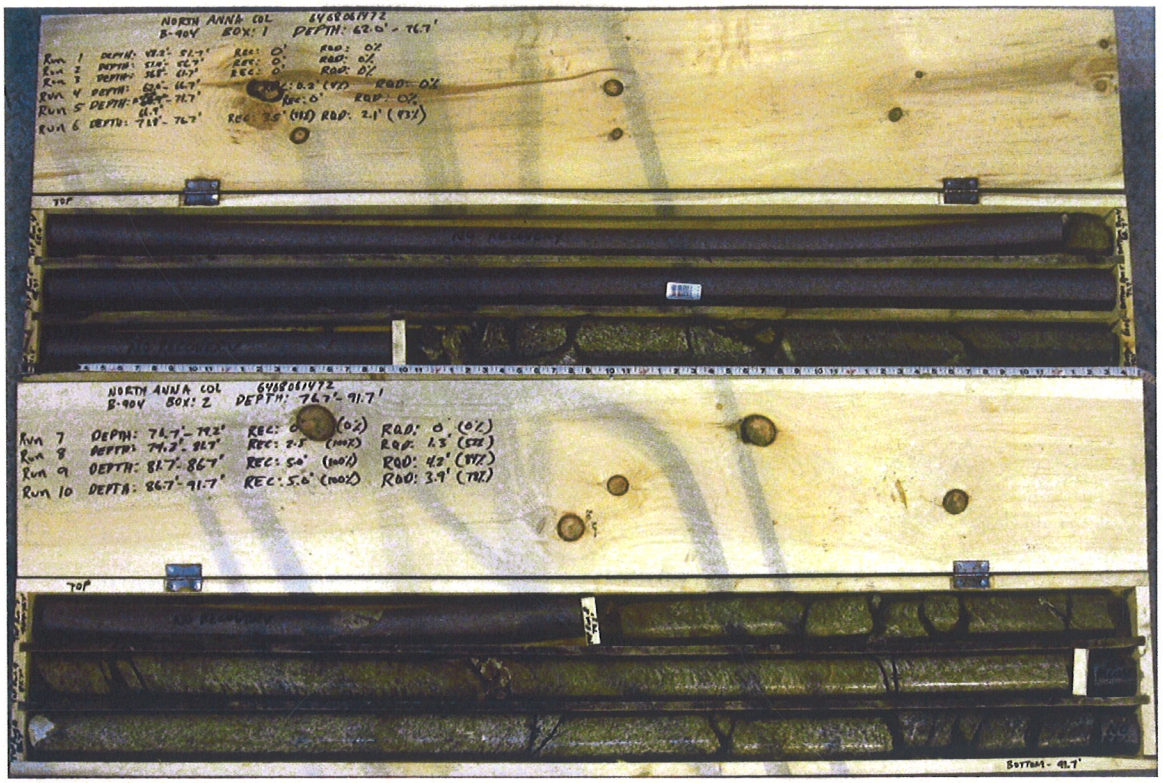
SITE DESCRIPTION NORTH ANNA COL			**GROUND WATER (ft)**
BORING NO. B-904	**DRILL METHOD:** Rotary Wash/Core	**SAMPLE METHODS:** SPT/CORE	**0 HR.** 22.3
COLLAR ELEV. 316.8 ft **(NAVD88)**	**NORTHING** 3,909,692 **US ft (NAD83)**	**EASTING** 11,685,970 **US ft (NAD83)**	**24 HR.** 22.7
TOTAL DEPTH 151.7 ft	**DRILL MACHINE** CME 55LC Track	**DRILLER:** D. White	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/19/06	**COMPLETED** 9/22/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline	
CORE SIZE HQ3	**TOTAL RUN** 102.6 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
190.1	126.7		2:22 2:30 2:44 2:34	100%	94%					Hard Rock: Light to dark gray, moderately weathered to fresh, close to wide fracturing, moderately hard to hard, QUARTZ-BIOTITE GNEISS with trace pyrite *(continued)*
185.1	131.7	5.0	2:22 2:42 2:17 2:48 2:34	(5.0) 100%	(4.5) 90%	18				(1 joint at 70° with weathering; 2 joints at 45° and 4 joints at 20-30° with weathering and Fe staining)
180.1	136.7	5.0	2:39 2:49 3:05 3:05 2:35	(5.0) 100%	(4.2) 84%	19				(1 joint at 80°; 1 joint at 45°; 2 joints at 30°)
175.1	141.7	5.0	3:44 2:43 2:43 3:22 2:37	(4.9) 98%	(4.8) 96%	20				-No Joints
170.1	146.7	5.0	2:57 3:53 3:34 3:52 2:59	(4.8) 96%	(4.6) 92%	21				(3 joints at 45° with weathering; 2 joints at 30° with weathering and clay)
165.1	151.7	5.0	2:35 3:11 3:25 3:09 3:16	(5.0) 100%	(4.8) 96%	22				-No Joints 165.1 151.7
										Coring terminated at 151.7 ft in Hard Rock: Hard QUARTZ-BIOTITE GNEISS



B-904 – Box 1
B-904 – Box 2

B-904 – Box 3
B-904 – Box 4

B-904 – Box 5
B-904 – Box 6