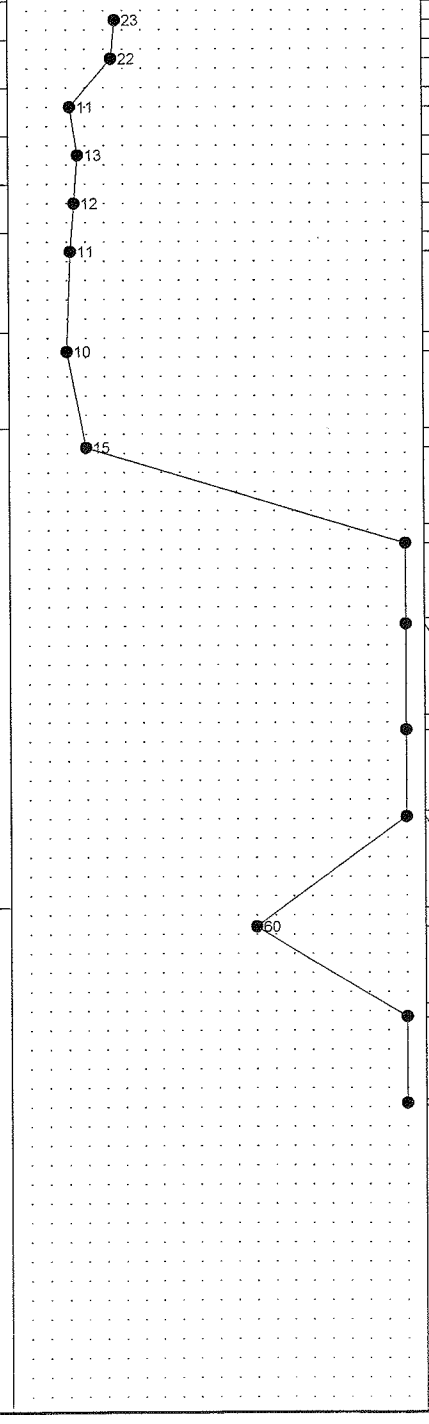
GEOTECHNICAL BORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	**COUNTY** Louisa, VA	**GEOLOGIST** S.Lehman	
SITE DESCRIPTION NORTH ANNA COL			**GROUND WATER (ft)**
BORING NO. B-908	**DRILL METHOD:** Rotary Wash/Core	**SAMPLE METHODS:** SPT/CORE	**0 HR.** 16.0
COLLAR ELEV. 307.7 ft (NAVD88)	**NORTHING** 3,909,717 US ft (NAD83)	**EASTING** 11,686,061 US ft (NAD83)	**24 HR.** 17.1
TOTAL DEPTH 151.4 ft	**DRILL MACHINE** CME 55LC Track	**DRILLER:** F. Cox	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/13/06	**COMPLETED** 9/18/06	**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
307.7								Ground Surface
306.2	1.5				908-1			307.7 — 0.0 Silty, fine to medium SAND (SM) olive yellow (2.5Y 6/6) dry, medium dense (Residual Soil)
304.2	3.5	11	11	12	908-2			304.2 — 3.5 GRAVEL (GM) boulder of Weathered Rock:
301.7	6.0	28	13	9	908-3			302.7 — 5.0 Light brown, very severely weathered, very soft to hard, GNEISS Silty, fine to medium SAND (SM) strong brown to light yellowish brown (2.5Y 6/4) dry to moist, medium dense, saprolitic (Residual Soil)
299.2	8.5	6	6	5	908-4			
296.7	11.0	4	6	7	908-5			
294.2	13.5	3	4	8	908-6			
289.0	18.7	7	6	5	908-7			291.7 — 16.0 SILT (ML) yellowish brown (10YR 5/6) moist, stiff, sandy (Residual Soil)
284.0	23.7	2	5	5	908-8			286.7 — 21.0 Silty, fine SAND (SM) dark yellowish brown (10YR 4/6), moist, medium dense, (Residual Soil)
279.0	28.7	5	6	9	908-9			280.7 — 27.0 Weathered Rock: sampled as SAND (SW), brownish yellow (10YR 6/6) to strong brown (7.5YR 5/6), moist, very dense, fine to coarse grained, Fe stained (GNEISS)
274.1	33.6	49	50/0.5		908-10			
269.1	38.6	50/0.3			908-11			
264.1	43.6	48	50/0.3		908-12			
259.1	48.6	50/0.3			908-13			261.2 — 46.5 Silty, fine SAND (SM) olive brown (2.5Y 4/4), moist, very dense (Residual Soil)
254.1	53.6	15	28	32	908-14			256.2 — 51.5 Weathered Rock: sampled as silty SAND (SM) dark yellowish brown (10YR 4/6), light reddish brown to light gray, moist, very dense, severely weathered, soft to moderately hard, GNEISS
249.1	58.6	28	50/0.2		908-15			
		50/0.2						245.0 — 62.7 Hard Rock: Light gray with orange Fe staining, moderately severe to slightly weathered, close to moderately close fracturing, soft to moderately hard, QUARTZ GNEISS with biotite

BLOWS PER FOOT: 0 20 40 60 80 100



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

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TOTAL DEPTH 151.4 ft	**DRILL MACHINE** CME 55LC Track	**DRILLER:** F. Cox	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/13/06	**COMPLETED** 9/18/06	**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
232.9					Continued from previous page				
	231.3								76.4 Hard Rock: Light gray, moderately weathered to fresh, close to wide fracturing, medium hard to hard, QUARTZ GNEISS with biotite
	206.3								101.4 Weathered Rock: Severely weathered, BIOTITE GNEISS (No recovery)
	204.0								103.7 Hard Rock: Dark gray, moderately severe to slightly weathered, close fracturing, soft to moderately hard, BIOTITE GNEISS
	201.3								106.4 Hard Rock: Light to dark gray, fresh, wide fracturing, hard, QUARTZ-BIOTITE GNEISS
	193.0								114.7
	192.4								115.3 Weathered Rock: Severely weathered, BIOTITE GNEISS (No recovery) Hard Rock: Light to dark gray with pink, slightly weathered to fresh, close to wide fracturing, moderately hard to hard, QUARTZ-BIOTITE GNEISS with trace pyrite and magnetite

GEOTECHNICAL BORING LOG

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TOTAL DEPTH 151.4 ft	**DRILL MACHINE** CME 55LC Track	**DRILLER:** F. Cox	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/13/06	**COMPLETED** 9/18/06	**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
158.1					Continued from previous page				
									156.3 — 151.4 Boring and coring terminated at 151.4 ft in Hard Rock: Hard, QUARTZ-BIOTITE GNEISS

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

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-908	**DRILL METHOD:** Rotary Wash/Core	**SAMPLE METHODS:** SPT/CORE	**0 HR.** 16.0
COLLAR ELEV. 307.7 ft **(NAVD88)**	**NORTHING** 3,909,717 **US ft (NAD83)**	**EASTING** 11,686,061 **US ft (NAD83)**	**24 HR.** 17.1
TOTAL DEPTH 151.4 ft	**DRILL MACHINE** CME 55LC Track	**DRILLER:** F. Cox	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/13/06	**COMPLETED** 9/18/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline	
CORE SIZE HQ3	**TOTAL RUN** 88.7 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 @ 62.7 ft
245.0	62.7	3.7	2:12 3:10 3:22 2:47/0.7	(3.2) 86%	(1.7) 46%	1				245.0 62.7 Hard Rock: Light gray with orange Fe staining, moderately severe to slightly weathered, close to moderately close fracturing, soft to moderately hard, QUARTZ GNEISS with biotite (2 joints at 20° with trace clay and Fe stain; 1 joint at 85° with Fe stain; 1 joint at 45° with trace clay and Fe stain) (1 joint at 40° and 2 joints at 20° with trace clay and Fe stain)
241.3	66.4	5.0	3:05 2:46 2:39 2:31 2:34	(5.0) 100%	(5.0) 100%	UC-67.5'				
236.3	71.4	5.0	2:15 1:40 3:38 4:38 5:03	(4.8) 96%	(3.7) 74%	3				(5 joints at 45° weathered with Fe stain; 1 joint at 30° weathered)
231.3	76.4	5.0	3:50 2:50 2:20 2:50 2:21	(4.8) 96%	(4.8) 96%	UCS-79.4'				231.3 76.4 Hard Rock: Light gray, moderately weathered to fresh, close to wide fracturing, medium hard to hard, QUARTZ GNEISS with biotite (1 joint at 80° with Fe stain; 2 joints at 40° with trace clay and Fe stain)
226.3	81.4	5.0	2:28 2:13 2:15 2:38 3:08	(5.0) 100%	(5.0) 100%	5				(1 joint at 45° weathered)
221.3	86.4	5.0	2:04 1:52 2:16 2:04 1:50	(5.0) 100%	(5.0) 100%	6				(1 joint at 60°)
216.3	91.4	5.0	2:22 1:52 2:02 2:25 2:36	(4.9) 98%	(4.9) 98%	UC-96.0'				-No Joints, slightly weathered in biotite rich zones at 91.6 ft and 93.1 ft
211.3	96.4	5.0	2:07 2:18 3:00 2:30 2:40	(4.8) 96%	(3.9) 78%	8				(2 joints at 20° with Fe stain; 3 joints at 40° weathered)
206.3	101.4	5.0	1:42 1:35 2:04 2:04 2:12	(2.5) 50%	(0.8) 16%	9				206.3 101.4 Weathered Rock: Severely weathered, BIOTITE GNEISS (No recovery) 204.0 103.7 Hard Rock: Dark gray, moderately severe to slightly weathered, close fracturing, soft to moderately hard, BIOTITE GNEISS 201.3 106.4
201.3	106.4	5.0	1:48 2:20 2:36 3:04 3:40	(5.0) 100%	(5.0) 100%	10				Hard Rock: Light to dark gray, fresh, wide fracturing, hard, QUARTZ-BIOTITE GNEISS -No Joints
196.3	111.4	3.3	3:40 3:03 3:04 1:21/0.3	(3.2) 97%	(3.2) 97%	UC-112.7'				(1 joint at 30° slightly weathered)
193.0	114.7	0.6	4:54/0.7	(0.0) 0%	(0.0) 0%	12				193.0 114.7 192.4 115.3 Weathered Rock: Severely weathered, BIOTITE GNEISS (No recovery)
192.4	115.3	1.1	3:45/1.1			13				-No recovery
191.3	116.4	5.0	3:51 3:52 4:00 3:24 2:50	(1.1) 100% (5.0) 100%	(1.1) 100% (5.0) 100%	14				Hard Rock: Light to dark gray with pink, slightly weathered to fresh, close to wide fracturing, moderately hard to hard, QUARTZ-BIOTITE GNEISS with trace pyrite and magnetite (1 joint at 30° slightly weathered and Fe stained) -No Joints (1 joint at 45° slightly weathered)
186.3	121.4	5.0	3:01 2:34 2:49 3:25 2:25	(5.0) 100%	(5.0) 100%	15				
181.3	126.4	5.0	2:45 3:11 3:08 3:15 3:48	(5.0) 100%	(5.0) 100%	16				-No Joints
176.3	131.4	5.0	5:13 3:17 2:28 2:42 2:35	(5.0) 100%	(5.0) 100%	UCS-135.7'				(1 joint at 45° and 1 joint at 80° both slightly weathered; quartz vein with pyrite and chlorite at 131.8 ft)
171.3	136.4	5.0	2:56	(5.0)	(5.0)	18				-No Joints

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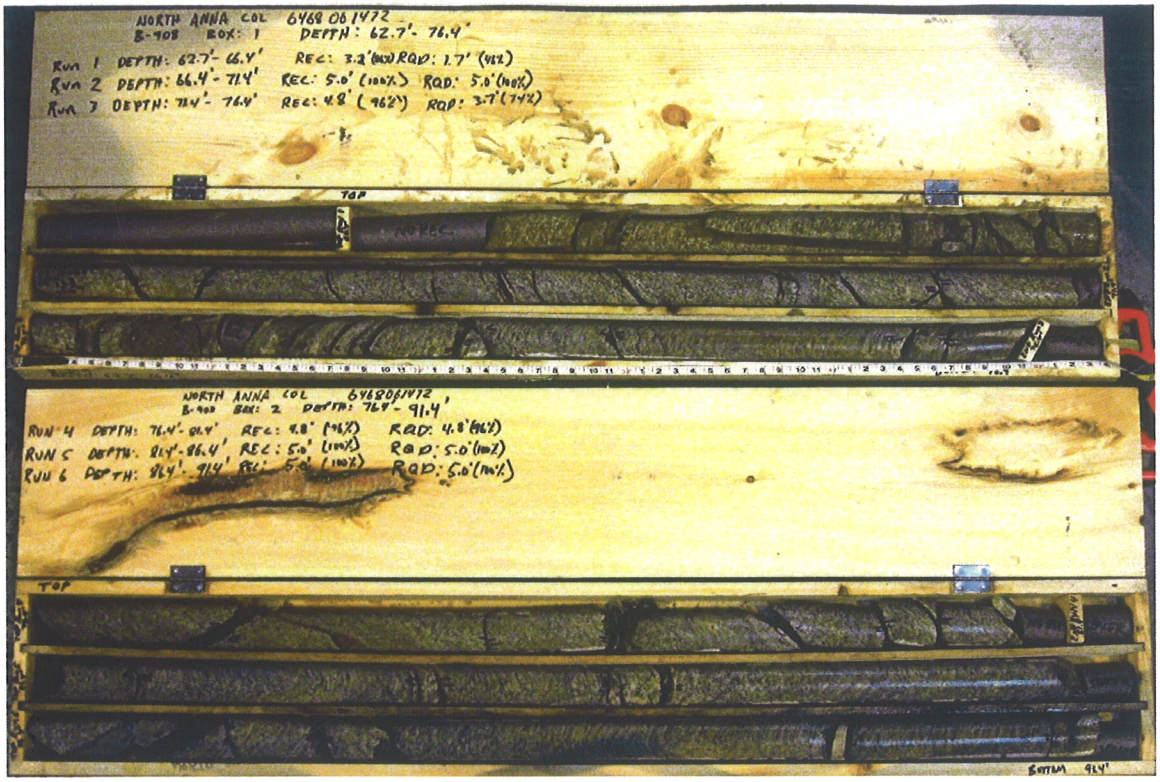
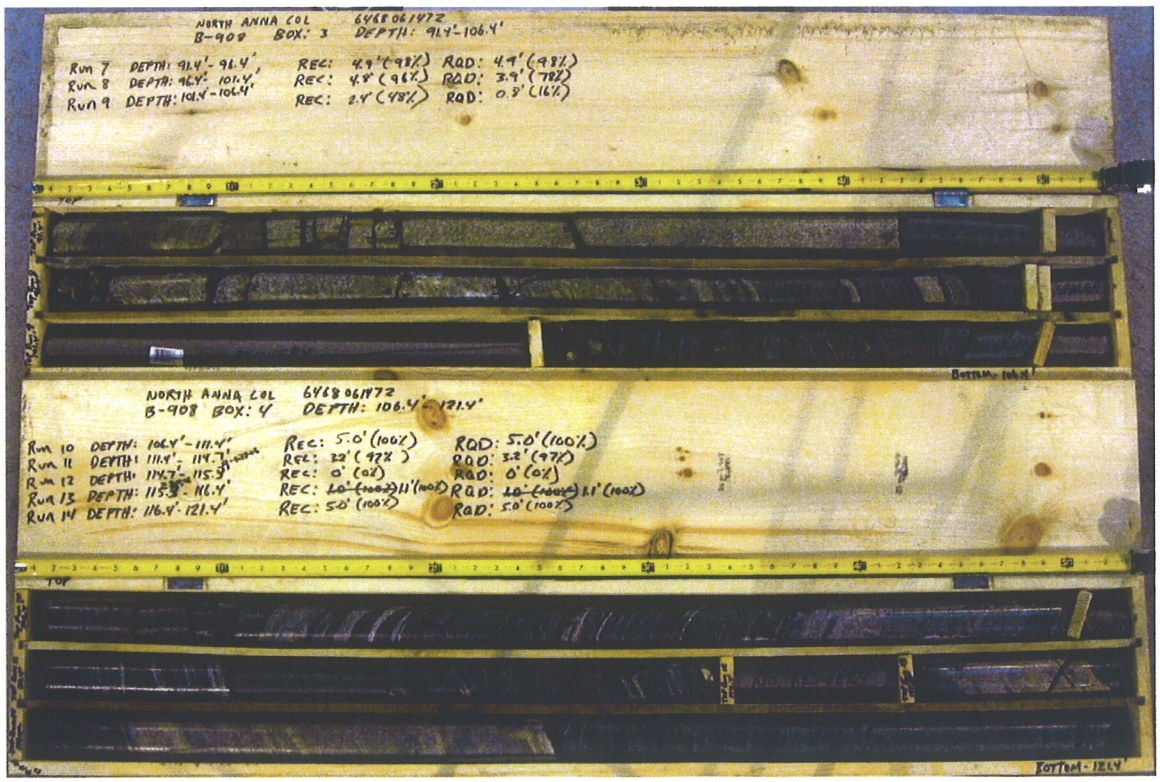
TOTAL DEPTH 151.4 ft	**DRILL MACHINE** CME 55LC Track	**DRILLER:** F. Cox	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/13/06	**COMPLETED** 9/18/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline	
CORE SIZE HQ3	**TOTAL RUN** 88.7 ft		

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
			2:52 2:50 2:35 2:30	100%	100%					Hard Rock: Light to dark gray with pink, slightly weathered to fresh, close to wide fracturing, moderately hard to hard, QUARTZ-BIOTITE GNEISS with trace pyrite and magnetite *(continued)*
166.3	141.4									
		5.0	2:26 2:30 2:35 3:02 3:21	(5.0) 100%	(5.0) 100%	19				(1 joint at 25° slightly weathered)
161.3	146.4									
		5.0	3:39 4:12 3:45 3:44 3:38	(5.0) 100%	(5.0) 100%	UC-146.8'				-No Joints
156.3	151.4									156.3 151.4
										Coring terminated at 151.4 ft in Hard Rock: Hard, QUARTZ-BIOTITE GNEISS

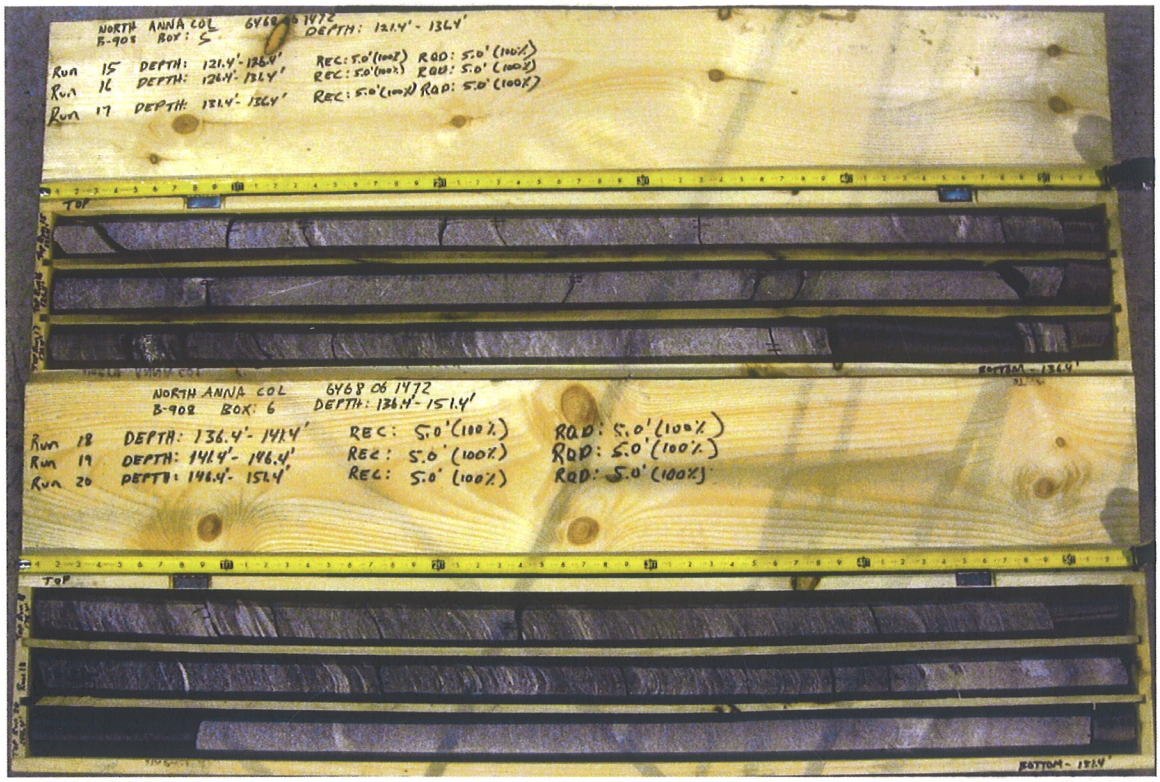
NORTH ANNA COL CORE NORTH ANNA COL DATA REPORT REV0.GPJ NORTH ANNA COL.GDT 1/19/07



B-908 – Box 1
B-908 – Box 2



B-908 – Box 3
B-908 – Box 4



B-908 – Box 5
B-908 – Box 6