GEOTECHNICAL BORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	COUNTY Louisa, VA	GEOLOGIST J. Lachewitz
SITE DESCRIPTION NORTH ANNA COL		GROUND WATER (ft)
BORING NO. B-911	DRILL METHOD: Mud Rotary/Core	SAMPLE METHODS: SPT/CORE
COLLAR ELEV. 299.8 ft (NAVD88)	NORTHING 3,909,920 US ft (NAD83)	EASTING 11,685,993 US ft (NAD83)
TOTAL DEPTH 101.0 ft	DRILL MACHINE CME 550 ATV	DRILLER: G. Akins
DATE STARTED 8/8/06	COMPLETED 8/10/06	CORE BARREL TYPE: HQ 3 triple tube-wireline

GROUND WATER (ft)	
0 HR.	ND
24 HR.	ND

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
299.8					Ground Surface				299.8 — 0.0
298.3	1.5								Silty SAND (SM), dark brown (7.5YR 3/2), dry, medium dense, trace clay (Fill)
296.3	3.5	3	4	6	10	911-1			296.8 — 3.0
293.8	6.0	8	11	8	19	911-2			Silty SAND (SM), strong brown (7.5YR 4/6 to 7.5YR 5/8), moist, medium dense to very dense, trace rock fragments (Residual Soil)
291.8	8.0	5	4	6	10	911-3			
288.8	11.0	8	6	4	10	911-4			
286.3	13.5	6	7	9	16	911-5			
281.3	18.5	5	9	9	18	911-6			
276.3	23.5	13	25	46	71	911-7			278.8 — 21.0
									Weathered Rock: QUARTZ BIOTITE GNEISS
275.1	24.7	50/0.3				911-8			275.0 — 24.8
		50/0.1				911-9			Hard Rock: White to gray, moderately severe to moderately weathered, close fracturing, soft to moderately hard, QUARTZ BIOTITE GNEISS
									233.8 — 66.0
									Hard Rock: Gray to bluish gray, moderately weathered to fresh, close to wide fracturing, medium hard to hard, QUARTZ BIOTITE GNEISS

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SITE DESCRIPTION NORTH ANNA COL		GROUND WATER (ft)
BORING NO. B-911	DRILL METHOD: Mud Rotary/Core	SAMPLE METHODS: SPT/CORE	0 HR. ND
COLLAR ELEV. 299.8 ft (NAVD88)	NORTHING 3,909,920 US ft (NAD83)	EASTING 11,685,993 US ft (NAD83)	24 HR. ND
TOTAL DEPTH 101.0 ft	DRILL MACHINE CME 550 ATV	DRILLER: G. Akins	HAMMER TYPE 140 lbs Auto
DATE STARTED 8/8/06	COMPLETED 8/10/06	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
225.0					Continued from previous page				
									Hard Rock: Gray to bluish gray, moderately weathered to fresh, close to wide fracturing, medium hard to hard, QUARTZ BIOTITE GNEISS *(continued)*
									198.8 — 101.0
									Boring and coring terminated at 101.0 ft in Hard Rock: Medium to moderately hard, QUARTZ GNEISS

GEOTECHNICAL CORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	**COUNTY** Louisa, VA	**GEOLOGIST** J. Lachewitz
SITE DESCRIPTION NORTH ANNA COL		**GROUND WATER (ft)**
BORING NO. B-911	**DRILL METHOD:** Mud Rotary/Core	**SAMPLE METHODS:** SPT/CORE — **0 HR.** ND
COLLAR ELEV. 299.8 ft (NAVD88)	**NORTHING** 3,909,920 US ft (NAD83)	**EASTING** 11,685,993 US ft (NAD83) — **24 HR.** ND
TOTAL DEPTH 101.0 ft	**DRILL MACHINE** CME 550 ATV	**DRILLER:** G. Akins — **HAMMER TYPE** 140 lbs Auto
DATE STARTED 8/8/06	**COMPLETED** 8/10/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline
CORE SIZE HQ3	**TOTAL RUN** 76.2 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 @ 24.8 ft
275.0	24.8	1.3	4:15 1:58/0.3	(1.3) 100%	(1.1) 85%	1				275.0 — 24.8 Hard Rock: White to gray, moderately severe to moderately weathered, close fracturing, soft to moderately hard, QUARTZ BIOTITE GNEISS (1 joint at 90°; 2 joints at 15-30° with trace clay and Fe stain) (6 joints at 5-20° with Fe stain)
273.7	26.1	5.0	3:01 3:04 2:15 2:02 2:14	(4.7) 94%	(1.4) 28%	2				
268.7	31.1	4.9	2:01 1:35 1:25 1:15 1:38/0.9	(4.7) 96%	(2.5) 51%	UCS-34.3'				(6 joints at 5-45° with Fe stain)
263.8	36.0	5.1	2:09 1;23 1:41 1:21 1:23/1.1	(4.5) 88%	(3.5) 69%	4				(Multiple horizontal and vertical joints with Fe stain)
258.7	41.1	4.9	1:05 1:14 1:14 1:18 1:21/0.9	(4.5) 92%	(2.9) 59%	UC-44.3'				(4 joints at 0-20° with Fe stain)
253.8	46.0	5.0	0:50 0:58 0:57 1:00 1:15	(5.0) 100%	(4.4) 88%	6				(8 joints at 25-45° with Fe stain)
248.8	51.0	5.1	1:17 1:14 0:43 0:47 1:08/1.1	(3.0) 59%	(1.0) 20%	7				(1 joint at 45° with slight Fe stain; multiple horizontal and vertical joints)
243.7	56.1	5.0	0:54 0:56 0:52 0:48 1:02	(5.0) 100%	(4.8) 96%	8				(8 joints at 20-50° with Fe stain)
238.7	61.1	4.9	0:45 1:01 1:14 1:15 2:27/0.9	(4.9) 100%	(3.7) 76%	9				(7 joints at 0-45° with Fe stain)
233.8	66.0									233.8 — 66.0
		4.9	2:18 1:47 2:36 4:09 7:43/0.9	(4.9) 100%	(4.4) 90%	UC-66.5'				Hard Rock: Gray to bluish gray, moderately weathered to fresh, close to wide fracturing, medium hard to hard, QUARTZ BIOTITE GNEISS (1 joint at 5° with slight Fe stain)
228.9	70.9	5.0	3:40 4:47 2:56 2:53 5:09	(5.0) 100%	(4.9) 98%	11				(1 joint at 10°)
223.9	75.9	5.1	4:31 4:32 4:47 5:39 7:01/1.1	(5.1) 100%	(4.7) 92%	12				(3 joints at 65-85° slighlty weathered)
218.8	81.0	4.9	4:58 6:14 6;01 5:15 8:12/0.9	(4.9) 100%	(4.6) 94%	UCS-82.1'				(2 joints at 85°; 4 joints at 0-10°; slight Fe stain)
213.9	85.9	5.1	3:58 2:52 2:12 1:52 2:57/1.1	(5.1) 100%	(4.6) 90%	14				(4 joints at 45°)
208.8	91.0	5.0	2:28 2:11 2:22 2:44 3:04	(5.0) 100%	(4.1) 82%	15				(4 joints 0-10° with clay and Fe stain)
203.8	96.0	5.0	3:29 2:59 3:09	(5.0) 100%	(4.6) 92%	UC-97.6'				(4 joints at 5° and 1 joint at 45° with slight weathering)

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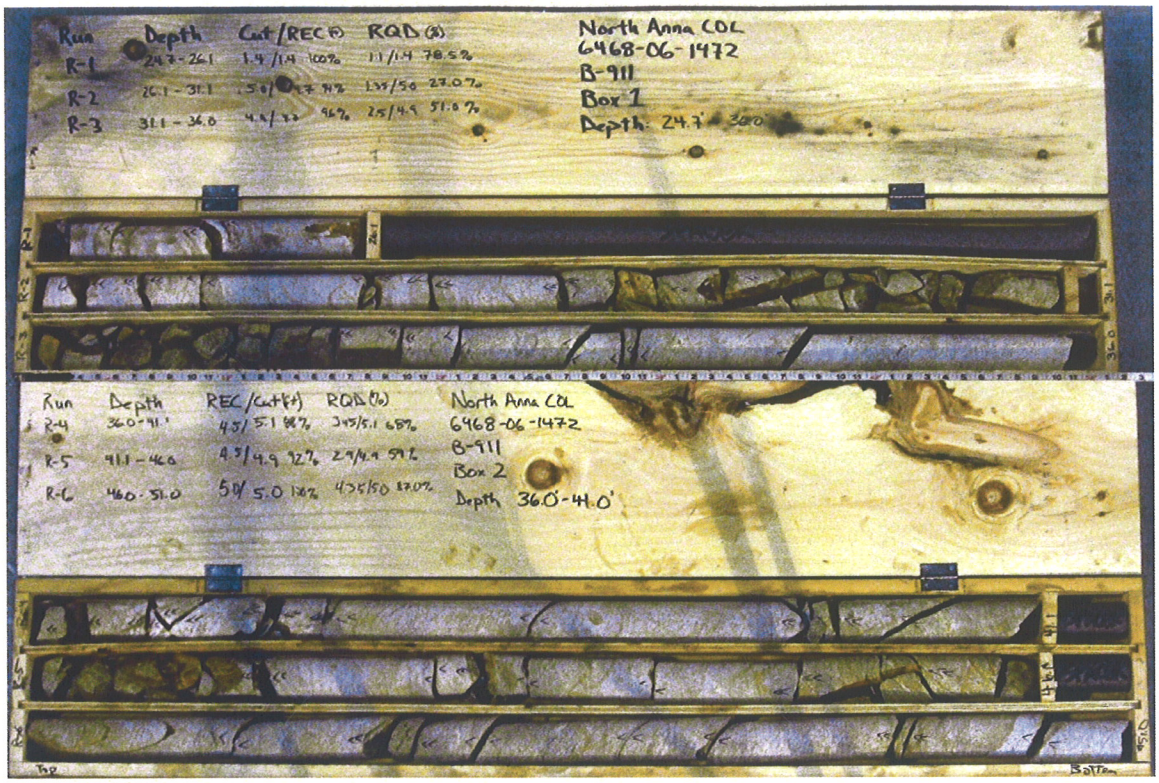
BORING NO. B-911	DRILL METHOD: Mud Rotary/Core	SAMPLE METHODS: SPT/CORE
COLLAR ELEV. 299.8 ft (NAVD88)	NORTHING 3,909,920 US ft (NAD83)	EASTING 11,685,993 US ft (NAD83)
TOTAL DEPTH 101.0 ft	DRILL MACHINE CME 550 ATV	DRILLER: G. Akins
DATE STARTED 8/8/06	COMPLETED 8/10/06	CORE BARREL TYPE: HQ 3 triple tube-wireline
CORE SIZE HQ3	TOTAL RUN 76.2 ft	

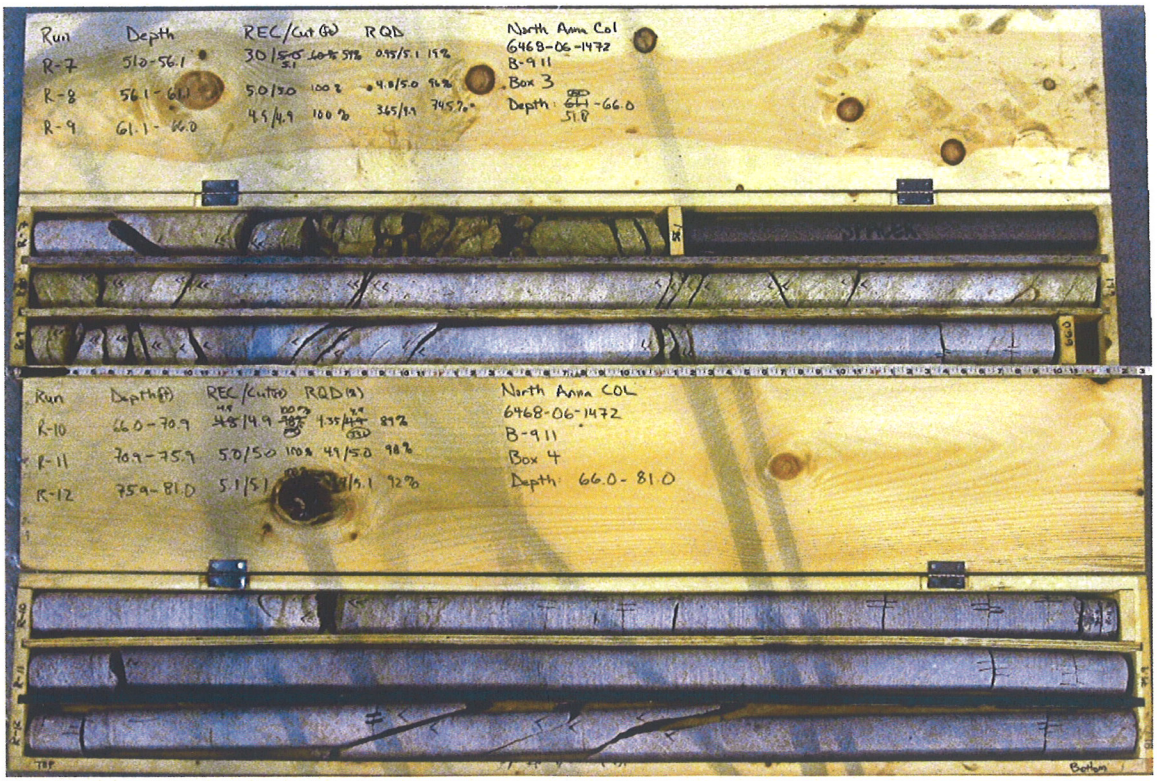
GROUND WATER (ft)	
0 HR.	ND
24 HR.	ND

HAMMER TYPE 140 lbs Auto

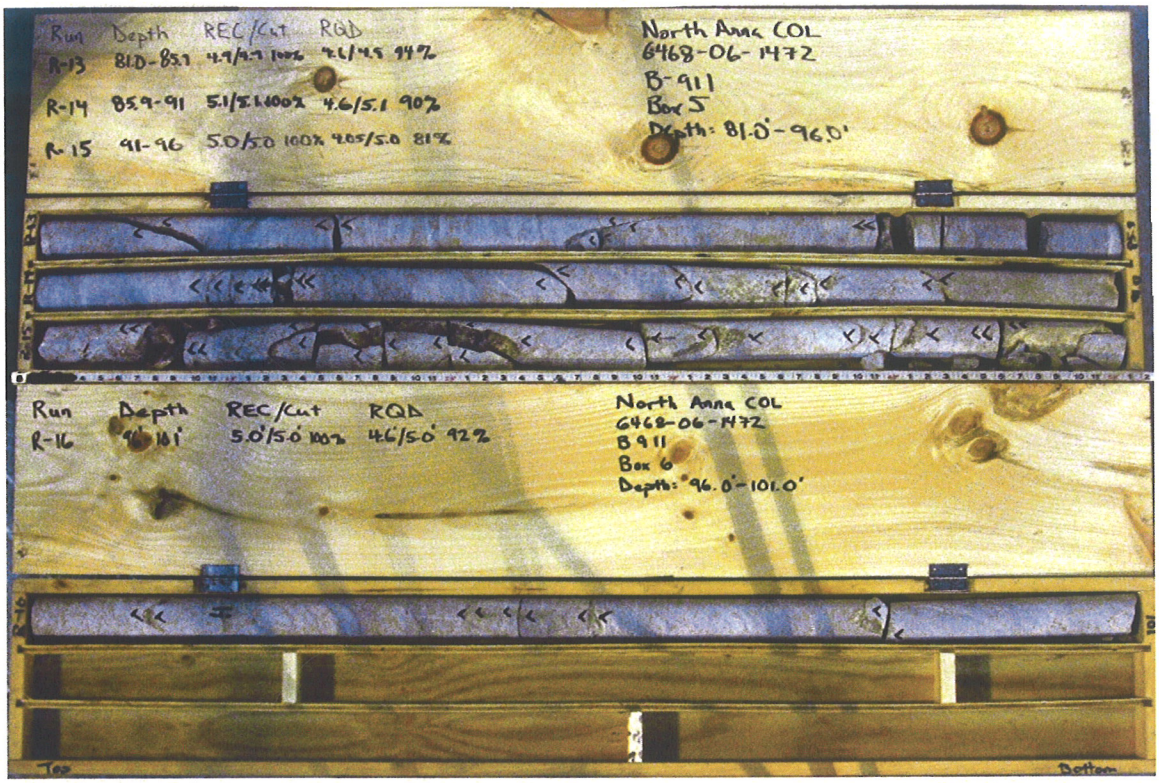
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
198.8	101.0		3:31 2:51							198.8 — 101.0 Coring terminated at 101.0 ft in Hard Rock: Medium to moderately hard, QUARTZ GNEISS



B-911 – Box 1
B-911 – Box 2



B-911 – Box 3
B-911 – Box 4



B-911 – Box 5
B-911 – Box 6

GEOTECHNICAL BORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	COUNTY Louisa, VA	GEOLOGIST M. Lear/ J. Lachewitz
SITE DESCRIPTION NORTH ANNA COL		GROUND WATER (ft)
BORING NO. B-911A	DRILL METHOD: Mud Rotary	SAMPLE METHODS: UD/PITCHER BARREL
COLLAR ELEV. 299.9 ft (NAVD88)	NORTHING 3,909,916 US ft (NAD83)	EASTING 11,686,001 US ft (NAD83)
TOTAL DEPTH 21.7 ft	DRILL MACHINE CME 550 ATV	DRILLER: F. Cox
DATE STARTED 10/24/06	COMPLETED 10/25/06	CORE BARREL TYPE: NA

GROUND WATER (ft)	
0 HR.	ND
24 HR.	ND

HAMMER TYPE NA

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
299.9					Ground Surface				299.9 — 0.0
									No samples due to utility clearance operations- soft dig/vac. truck excavation
									292.1 — 7.8
290.2	9.7					911A-UD-1			Silty, fine to coarse SAND (SM), Tan, moist, micaceous, relict rock fabric (Residual Soil)
									911A-UD-1: Pushed from 9.7-11.7 ft; push pressure=1200-1500 psi; recovery=1.7 ft
285.2	14.7					911A-UD-2			911A-UD-2: Pushed from 14.7-15.5 ft; push pressure=1300 psi-weight of drill rig; recovery=0.6 ft
280.2	19.7					911A-PB-1			911A-PB-1: Advanced from 19.7-21.7 ft; recovery=0.9 ft
									278.9 — 21.0
									278.2 — 21.7
									Weathered Rock: BIOTITE-QUARTZ GNEISS
									Boring terminated at 21.7 ft in Weathered Rock: BIOTITE-QUARTZ GNEISS