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-939	**DRILL METHOD:** Mud Rotary/Core	**SAMPLE METHODS:** SPT/CORE	**0 HR.** 17.8
COLLAR ELEV. 254.0 ft (NAVD88)	**NORTHING** 3,911,318 US ft (NAD83)	**EASTING** 11,686,606 US ft (NAD83)	**24 HR.** 16.1
TOTAL DEPTH 76.1 ft	**DRILL MACHINE** CME 55 Truck	**DRILLER:** H. Meyerson	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/20/06	**COMPLETED** 9/21/06	**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
254.0					Ground Surface				254.0 — 0.0
252.8	1.2								Silty, fine to coarse SAND (SM) yellowish brown (10YR 5/6), moist, medium dense (Fill)
250.2	3.8	26	19	7	26	939-1			250.5 — 3.5
247.7	6.3	4	6	9	15	939-2			Sandy CLAY (CL) yellowish brown (10YR 5/4), moist, stiff, silt (Fill) 248.0 — 6.0
245.2	8.8	6	6	9	15	939-3			Silty, fine to coarse SAND (SM) yellowish brown (10YR 5/6), dark brown (10YR 3/3), and dark yellowish brown (10YR 3/6), moist, medium dense, trace clay and gravel (Fill)
242.7	11.3	4	3	7	10	939-4			
240.2	13.8	3	3	7	10	939-5			
235.3	18.7	4	7	8	15	939-6	▼ ▽		
230.2	23.8	3	7	7	14	939-7			
225.2	28.8	7	11	9	20	939-8			228.0 — 26.0
220.2	33.8	5	7	5	12	939-9			Sandy SILT (ML) yellowish red (5YR 4/6), moist, stiff, clay (Fill)
215.2	38.8	3	3	5	8	939-10			216.0 — 38.0
210.2	43.8	15	25	42	67	939-11			Silty, fine to coarse SAND (SM) brownish yellow (10YR 6/8), moist, very dense (Residual Soil)
205.2	48.8	27	48	50/0.3		939-12			209.2 — 44.8
202.8	51.2	50/0.2				939-13			Weathered Rock: Yellowish brown (10YR 5/8&5/6), light brownish red and reddish brown, severely weathered, very close to close fracturing, soft to medium hard, BIOTITE-QUARTZ GNEISS
192.8	61.2	50/0.1				939-14			
187.9	66.1	50/0.4				939-15			
182.9	71.1	50/0.4				939-16			
		50/0.2				939-17			

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

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-939	DRILL METHOD: Mud Rotary/Core	SAMPLE METHODS: SPT/CORE	0 HR. 17.8
COLLAR ELEV. 254.0 ft (NAVD88)	NORTHING 3,911,318 US ft (NAD83)	EASTING 11,686,606 US ft (NAD83)	24 HR. 16.1
TOTAL DEPTH 76.1 ft	DRILL MACHINE CME 55 Truck	DRILLER: H. Meyerson	HAMMER TYPE 140 lbs Auto
DATE STARTED 9/20/06	COMPLETED 9/21/06	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
179.2					Continued from previous page				
									177.9 — 76.1 Boring and coring terminated at 76.1 ft in Weathered Rock: Severely weathered, medium hard, BIOTITE-QUARTZ GNEISS

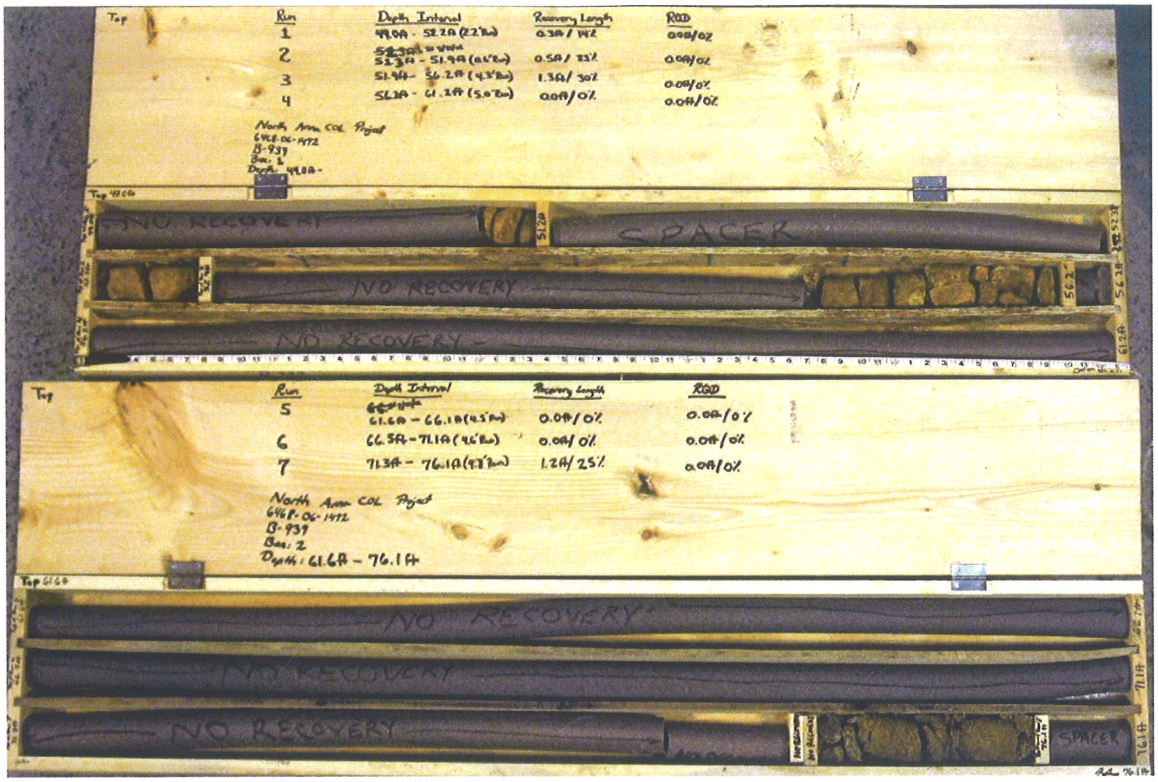
GEOTECHNICAL CORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	**COUNTY** Louisa, VA	**GEOLOGIST** S. Nicely
SITE DESCRIPTION NORTH ANNA COL		**GROUND WATER (ft)**
BORING NO. B-939	**DRILL METHOD: Mud Rotary/Core** / **SAMPLE METHODS: SPT/CORE**	**0 HR.** 17.8
COLLAR ELEV. 254.0 ft **(NAVD88)**	**NORTHING** 3,911,318 **US ft (NAD83)** / **EASTING** 11,686,606 **US ft (NAD83)**	**24 HR.** 16.1
TOTAL DEPTH 76.1 ft	**DRILL MACHINE** CME 55 Truck / **DRILLER: H. Meyerson**	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/20/06	**COMPLETED** 9/21/06 / **CORE BARREL TYPE: HQ 3 triple tube-wireline**	
CORE SIZE HQ3	**TOTAL RUN** 26.0 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 @ 49.0 ft
205.0 202.8	49.0 51.2	2.2	2:02 2:30/1.2	(0.3) 14%	(0.0) 0%	1				Weathered Rock: Yellowish brown (10YR 5/8&5/6), light brownish red and reddish brown, severely weathered, very close to close fracturing, soft to medium hard, BIOTITE-QUARTZ GNEISS *(continued)*
202.7 202.1	51.3 51.9	0.6 4.3	*N=50/0.1* 17:13/0.6 3:17/1.3 5:43 4:31 3:01	(0.5) 83% (1.3) 30%	(0.0) 0% (0.0) 0%	*939-14* 2 3				-Highly fractured and weathered throughout run -Lense of Hard Rock: Light gray with reddish brown, moderately weathered, very close to close fracturing, hard, BIOTITE-QUARTZ GNEISS from 51.3-51.8 ft
197.8	56.2	5.0	1:21 0:48 0:44 0:56 0:52	(0.0) 0%	(0.0) 0%	4				-Highly fractured and weathered throughout run with vertical fractures -No Recovery
192.8	61.2		*N=50/0.4*			*939-15*				
192.4 187.9	61.6 66.1	4.5	1:27 1:47 1:56 2:26/1.5	(0.0) 0%	(0.0) 0%	5				-No Recovery
187.5 182.9	66.5 71.1	4.6	*N=50/0.4* 2:16 1:44 0:49 2:31/1.6	(0.0) 0%	(0.0) 0%	*939-16* 6				-No Recovery
182.7 177.9	71.3 76.1	4.8	*N=50/0.2* 1:45 1:46 2:40 2:27 3:00/0.8	(1.2) 25%	(0.0) 0%	*939-17* 7				-Highly fractured and weathered throughout run 177.9 76.1

Coring terminated at 76.1 ft in Weathered Rock: Severely weathered, medium hard, BIOTITE-QUARTZ GNEISS



B-939 – Box 1
B-939 – Box 2

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-940	**DRILL METHOD: Mud Rotary/Core**	**SAMPLE METHODS: SPT/CORE**	**0 HR.** 15.9
COLLAR ELEV. 268.3 ft **(NAVD88)**	**NORTHING** 3,910,267 **US ft (NAD83)**	**EASTING** 11,688,901 **US ft (NAD83)**	**24 HR.** ND
TOTAL DEPTH 76.1 ft	**DRILL MACHINE** CME 55 Truck	**DRILLER: H. Meyerson**	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 11/2/06	**COMPLETED** 11/3/06	**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
268.3					Ground Surface				268.3 — 0.0
									No samples due to utility clearance operations- soft dig/vac. truck excavation
260.5	7.8								260.5 — 7.8
		14	28	40	68	940-1			Silty, fine to coarse SAND (SM) olive brown (2.5Y 4/3) and light olive brown (2.5Y 5/4), dry to moist, dense and very dense (Residual Soil)
257.3	11.0								
		11	15	22	37	940-2			
254.5	13.8								
		15	19	30	49	940-3	▽		
249.8	18.5								249.8 — 18.5
		50/0.0				940-4			Hard Rock: dark gray, moderately weathered, very close to close fracturing, hard to soft, QUARTZ-BIOTITE GNEISS — 247.1 — 21.2
									Weathered Rock: Dark brown and dark gray, severely weathered, very close to close fracturing, medium hard to very soft, QUARTZ-BIOTITE GNEISS
242.1	26.2								
		34	50	41	91	940-5			
237.1	31.2								
		27	37	50/0.4		940-6			234.7 — 33.6
									Hard Rock: Dark brown to light gray, moderately severe to moderately weathered, very close to close fracturing, soft to medium hard, QUARTZ-BIOTITE GNEISS — 232.2 — 36.1
									Weathered Rock: Dark gray, severely weathered, very close to close fracturing, very soft to medium hard, QUART-BIOTITE GNEISS — 228.2 — 40.1
									Hard Rock: Dark brown and dark to light gray, moderately severe to slightly weathered, very close to moderately close fracturing, soft to very hard, QUARTZ-BIOTITE GNEISS to 56.2 ft then BIOTITE-QUARTZ GNEISS
									202.1 — 66.2
									Hard Rock: Light gray, very slightly weathered to fresh, very close to moderately close fracturing, hard to 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-940	DRILL METHOD: Mud Rotary/Core	SAMPLE METHODS: SPT/CORE
COLLAR ELEV. 268.3 ft (NAVD88)	NORTHING 3,910,267 US ft (NAD83)	EASTING 11,688,901 US ft (NAD83)
TOTAL DEPTH 76.1 ft	DRILL MACHINE CME 55 Truck	DRILLER: H. Meyerson
DATE STARTED 11/2/06	COMPLETED 11/3/06	CORE BARREL TYPE: HQ 3 triple tube-wireline

GROUND WATER (ft)	
0 HR.	15.9
24 HR.	ND

HAMMER TYPE 140 lbs Auto	

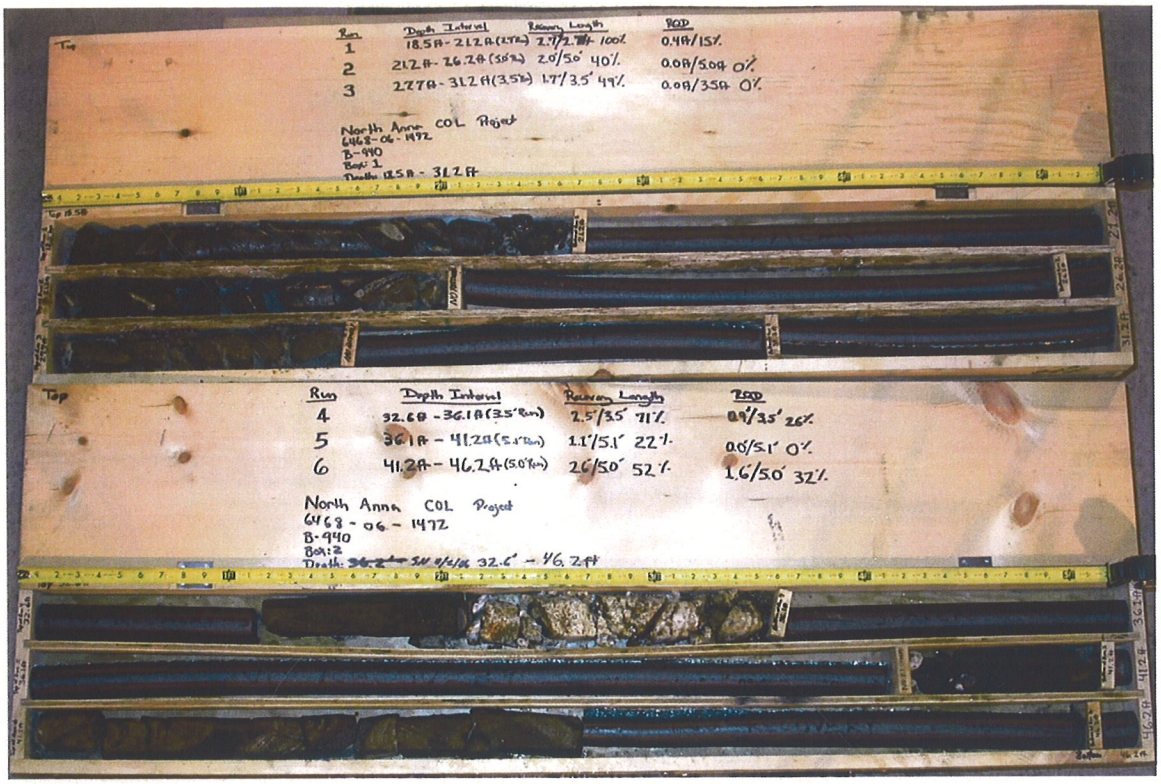
ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
193.5					Continued from previous page				
									192.2 — 76.1 Boring and coring terminated at 76.1 ft in Hard Rock: Hard to very hard, BIOTITE-QUARTZ GNEISS

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-940	DRILL METHOD: Mud Rotary/Core	SAMPLE METHODS: SPT/CORE	0 HR. 15.9
COLLAR ELEV. 268.3 ft (NAVD88)	NORTHING 3,910,267 US ft (NAD83)	EASTING 11,688,901 US ft (NAD83)	24 HR. ND
TOTAL DEPTH 76.1 ft	DRILL MACHINE CME 55 Truck	DRILLER: H. Meyerson	HAMMER TYPE 140 lbs Auto
DATE STARTED 11/2/06	COMPLETED 11/3/06	CORE BARREL TYPE: HQ 3 triple tube-wireline	
CORE SIZE HQ3	TOTAL RUN 54.7 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 @ 18.5 ft
249.8	18.5	2.7	N=50/0.0 3:24 6:27	(2.7) 100%	(0.4) 15%	1				249.8 Hard Rock: dark gray, moderately weathered, very close to close fracturing, hard to soft, QUARTZ-BIOTITE GNEISS (18.5)
247.1	21.2	5.0	3:15/0.7 3:10 2:59 1:37 1:13 1:23	(2.0) 40%	(0.0) 0%	2				247.1 -Highly fractured with Fe and Mn staining, quartz vein at 20.3 ft (21.2) Weathered Rock: Dark brown and dark gray, severely weathered, very close to close fracturing, medium hard to very soft, QUARTZ-BIOTITE GNEISS -No recovery 23.2-26.2 ft
242.1	26.2		N=91			940-5				
240.6	27.7	3.5	4:18 1:50 1:34 0:42/0.5	(1.7) 49%	(0.0) 0%	3				-Highly fractured, no recovery from 27.7-31.2 ft
237.1	31.2		N=50/0.4			940-6				
235.7	32.6	3.5	3:31 1:53 2:17/1.5	(2.5) 71%	(0.9) 26%	4				234.7 -Highly fractured quartz vein from 34.7-36.1 ft (33.6) Hard Rock: Dark brown to light gray, moderately severe to moderately weathered, very close to close fracturing, soft to medium hard, QUARTZ-BIOTITE GNEISS
232.2	36.1	5.1	1:57 4:31 2:30 3:30 3:33/1.1	(1.1) 22%	(0.0) 0%	5				232.2 (36.1) Weathered Rock: Dark gray, severely weathered, very close to close fracturing, very soft to medium hard, QUART-BIOTITE GNEISS 228.2 -Quartz vein from 36.1-36.2 ft, no recovery from 36.2-40.1 ft (40.1) Hard Rock: Dark brown and dark to light gray, moderately severe to slightly weathered, very close to moderately close fracturing, soft to very hard, QUARTZ-BIOTITE GNEISS to 56.2 ft then BIOTITE-QUARTZ GNEISS
227.1	41.2	5.0	2:29 3:06 2:41 3:16 3:11	(2.6) 52%	(1.6) 32%	6				-Highly fractured, no recovery from 43.8-46.2 ft
222.1	46.2	5.0	3:24 3:09 1:59 2:44 1:51	(4.2) 84%	(0.0) 0%	7				-Highly fractured; quartz vein at 49.6 ft and from 48.6-49.4 ft
217.1	51.2	5.0	1:23 1:48 2:11 2:02 2:29	(4.1) 82%	(1.7) 34%	8				-Highly fractured; quartz vein from 54.2-54.4 ft
212.1	56.2	5.0	2:38 3:38 3:42 3:37 3:43	(4.8) 96%	(4.1) 82%	9				(5 joints at 60-65°)
207.1	61.2	5.0	1:46 1:17 1:16 1:27 2:49	(2.7) 54%	(1.9) 38%	10				(2 joints at 10° with Fe staining; 1 joint at 50°; no recovery from 61.2-63.5 ft)
202.1	66.2	4.9	2:34 3:42 3:38 4:17 3:58/0.9	(4.9) 100%	(4.7) 96%	11				202.1 (66.2) Hard Rock: Light gray, very slightly weathered to fresh, very close to moderately close fracturing, hard to very hard, BIOTITE-QUARTZ GNEISS (2 joints at 40°; 1 joint at 70° with Fe staining and unknown radiating mineral)
197.2	71.1	5.0	3:12 3:15 3:12 3:31 3:02	(5.0) 100%	(4.2) 84%	12				(1 joint at 45°, 1 joint at 75°)
192.2	76.1									192.2 (76.1) Coring terminated at 76.1 ft in Hard Rock: Hard to very hard, BIOTITE-QUARTZ GNEISS



B-940 – Box 1
B-940 – Box 2

B-940 – Box 3
B-940 – Box 4

GEOTECHNICAL BORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	COUNTY Louisa, VA	GEOLOGIST J. Lachewitz / J. Wallen	
SITE DESCRIPTION NORTH ANNA COL			GROUND WATER (ft)
BORING NO. B-941	DRILL METHOD: Mud Rotary/Core	SAMPLE METHODS: SPT/CORE	0 HR. ND
COLLAR ELEV. 267.2 ft (NAVD88)	NORTHING 3,910,404 US ft (NAD83)	EASTING 11,688,913 US ft (NAD83)	24 HR. 11.0
TOTAL DEPTH 75.8 ft	DRILL MACHINE CME 550 ATV	DRILLER: G. Akins	HAMMER TYPE 140 lbs Auto
DATE STARTED 11/1/06	COMPLETED 11/2/06	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
267.2					Ground Surface				267.2 — 0.0 No samples due to utility clearance operations- soft dig/ vac. truck excavation
258.7	8.5								258.7 — 8.5 Silty, fine to medium SAND (SM) light olive brown (2.5Y 5/4) and yellowish brown (10YR 5/6), moist, dense to very dense, relict rock fabric (Residual Soil)
256.2	11.0	16	33	40	73	941-1			
252.8	14.4	17	42	50	92	941-2			
247.8	19.4	22	20	21	41	941-3			
242.8	24.4	33	32	50	82	941-4			244.2 — 23.0 Weathered Rock: Very dark gray (10YR 3/1) to gray and yellowish brown (yellowish brown (10YR5/6), moist, very dense, severely weathered, very soft to medium hard, BIOTITE-QUARTZ GNEISS
237.8	29.4	16	50/0.3			941-5			
233.7	33.5	26	50/0.2			941-6			
226.1	41.1	50/0.2				941-7			
220.8	46.4	21	50/0.4			941-8			222.2 — 45.0 Silty, fine to medium SAND (SM) very dark brown (10YR 2/2), moist, dense (Residual Soil)
		11	15	33	48	941-9			217.7 — 49.5 Hard Rock: Dark gray, moderately severe to moderately weathered, very close to close fracturing, soft to moderately hard, BIOTITE-QUARTZ GNEISS
									205.8 — 61.4 Hard Rock: Gray, slightly to very slightly weathered, close to moderately close fracturing, hard to very hard, BIOTITE-QUARTZ GNEISS

GEOTECHNICAL BORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	COUNTY Louisa, VA	GEOLOGIST J. Lachewitz / J. Wallen	
SITE DESCRIPTION NORTH ANNA COL			GROUND WATER (ft)
BORING NO. B-941	DRILL METHOD: Mud Rotary/Core	SAMPLE METHODS: SPT/CORE	0 HR. ND
COLLAR ELEV. 267.2 ft (NAVD88)	NORTHING 3,910,404 US ft (NAD83)	EASTING 11,688,913 US ft (NAD83)	24 HR. 11.0
TOTAL DEPTH 75.8 ft	DRILL MACHINE CME 550 ATV	DRILLER: G. Akins	HAMMER TYPE 140 lbs Auto
DATE STARTED 11/1/06	COMPLETED 11/2/06	CORE BARREL TYPE: HQ 3 triple tube-wireline	

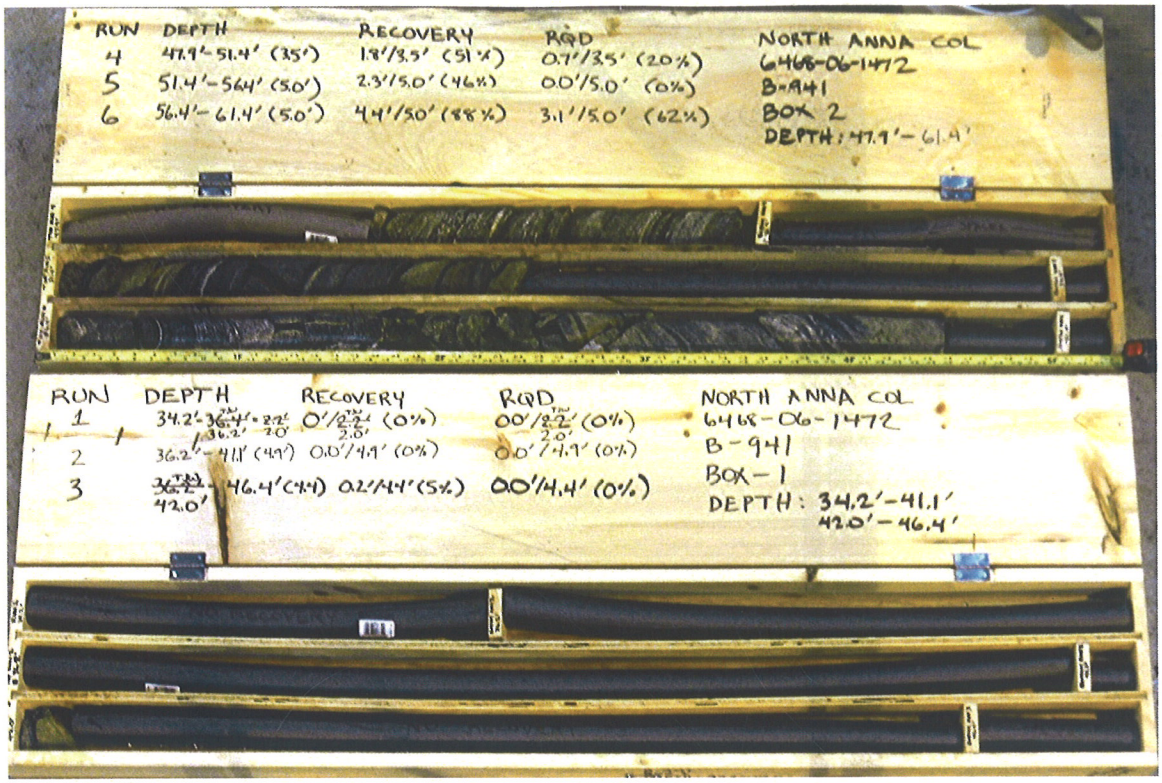
ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
192.4					Continued from previous page				
									191.4 — 75.8 Boring and coring terminated at 75.8 ft in Hard Rock: Very hard, BIOTITE-QUARTZ GNEISS

GEOTECHNICAL CORING LOG

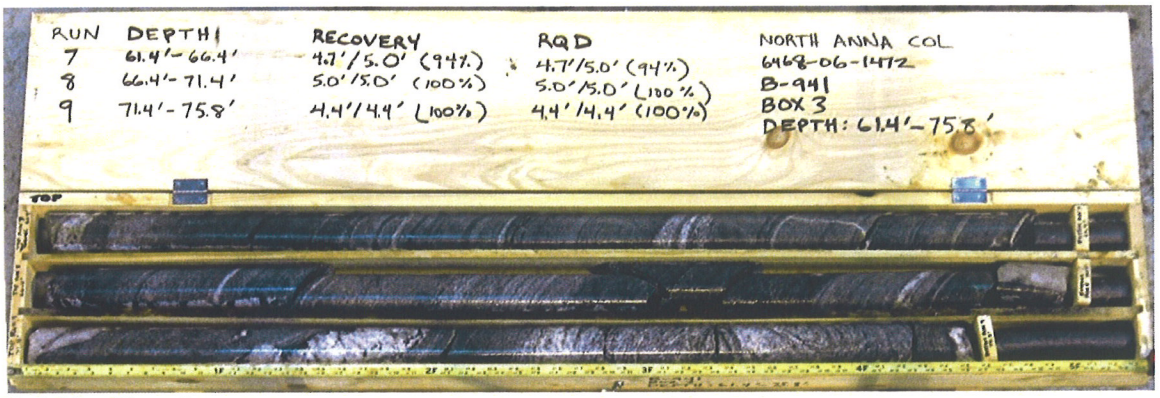
MACTEC

MACTEC PROJECT NO.: 6468-06-1472	**COUNTY** Louisa, VA	**GEOLOGIST** J. Lachewitz / J. Wallen
SITE DESCRIPTION NORTH ANNA COL		**GROUND WATER (ft)**
BORING NO. B-941	**DRILL METHOD:** Mud Rotary/Core	**SAMPLE METHODS:** SPT/CORE — **0 HR.** ND
COLLAR ELEV. 267.2 ft (NAVD88)	**NORTHING** 3,910,404 US ft (NAD83)	**EASTING** 11,688,913 US ft (NAD83) — **24 HR.** 11.0
TOTAL DEPTH 75.8 ft	**DRILL MACHINE** CME 550 ATV	**DRILLER:** G. Akins — **HAMMER TYPE** 140 lbs Auto
DATE STARTED 11/1/06	**COMPLETED** 11/2/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline
CORE SIZE HQ3	**TOTAL RUN** 39.2 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 @ 34.2 ft
233.0	34.2	2.0	1:08 1:19	(0.0) 0%	(0.0) 0%	1				Weathered Rock: Very dark gray (10YR 3/1) to gray and yellowish brown (yellowish brown (10YR5/6), moist, very dense, severely weathered, very soft to medium hard, BIOTITE-QUARTZ GNEISS *(continued)*
231.0	36.2	4.9	0:56 1:05 1:16 1:32 1:07/0.9	(0.0) 0%	(0.0) 0%	2				-No Recovery -No Recovery
226.1	41.1		*N=50/0.4*			*941-8*				
225.2	42.0	4.4	2:43/1.1 2:37 2:42 1:48/1.3	(0.2) 5%	(0.0) 0%	3				
220.8	46.4		*N=48*			*941-9*				
219.3	47.9	3.5	2:16 1:40 1:32 0:30/0.5	(1.8) 51%	(0.7) 20%	4				222.2 — 45.0 Silty, fine to medium SAND (SM) very dark brown (10YR 2/2), moist, dense (Residual Soil) (10 joints at 30°)
215.8	51.4	5.0	1:56 1:58 1:54 2:52 2:00	(2.3) 46%	(0.0) 0%	5				217.7 — 49.5 Hard Rock: Dark gray, moderately severe to moderately weathered, very close to close fracturing, soft to moderately hard, BIOTITE-QUARTZ GNEISS (11 joints at 30°)
210.8	56.4	5.0	2:16 2:23 3:40 3:02 3:36	(4.4) 88%	(3.1) 62%	6				(5 joints at 20-30°, 2 joints at 50°, 1 joint at 70°)
205.8	61.4	5.0	2:41 2:37 3:07 1:21 1:34	(4.7) 94%	(4.7) 94%	7				205.8 — 61.4 Hard Rock: Gray, slightly to very slightly weathered, close to moderately close fracturing, hard to very hard, BIOTITE-QUARTZ GNEISS (5 joints at 30°)
200.8	66.4	5.0	2:14 1:14 1:42 1:46 2:37	(5.0) 100%	(5.0) 100%	8				(3 joints at 40°, 1 joint at 70°, Quartz vein at 80° from 71.1-71.4 ft)
195.8	71.4	4.4	4:19 4:06 3:17 4:58 3:08/0.4	(4.4) 100%	(4.4) 100%	9				(1 joint at 40°; Quartz veins at 80° from 71.4-71.7 ft and at 50° from 72.4-73.2 ft, trace garnet in and around veins)
191.4	75.8									191.4 — 75.8 Coring terminated at 75.8 ft in Hard Rock: Very hard, BIOTITE-QUARTZ GNEISS



B-941 – Box 2
B-941 – Box 1



B-941 – Box 3

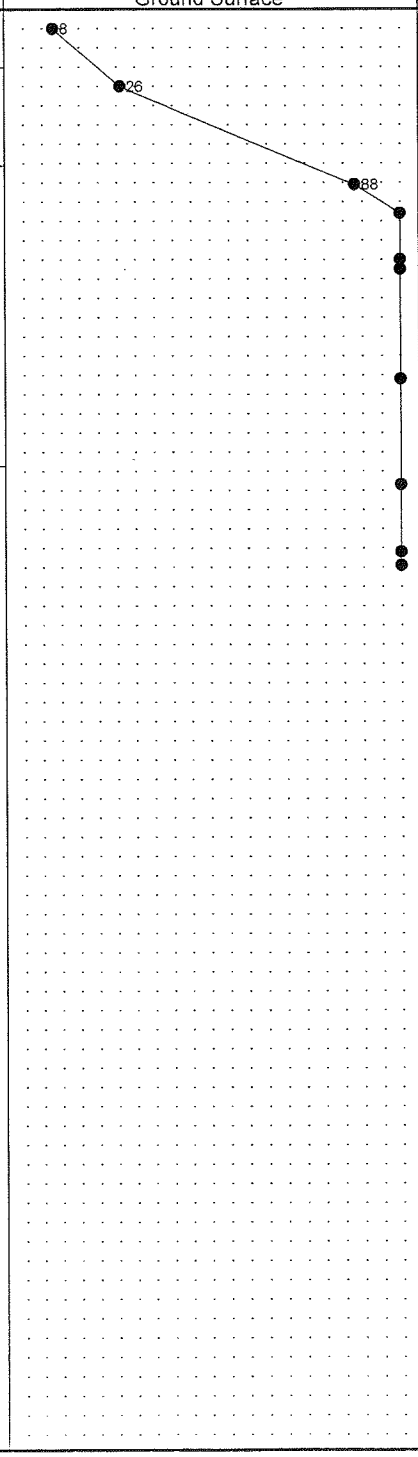
GEOTECHNICAL BORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	COUNTY Louisa, VA	GEOLOGIST S. Nicely	
SITE DESCRIPTION NORTH ANNA COL			GROUND WATER (ft)
BORING NO. B-942	DRILL METHOD: Mud Rotary/Core	SAMPLE METHODS: SPT/CORE	0 HR. 3.2
COLLAR ELEV. 291.9 ft (NAVD88)	NORTHING 3,909,615 US ft (NAD83)	EASTING 11,684,326 US ft (NAD83)	24 HR. 3.8
TOTAL DEPTH 100.8 ft	DRILL MACHINE CME 550 ATV	DRILLER: F. Cox (Knoxville 550)	HAMMER TYPE 140 lbs Auto
DATE STARTED 10/16/06	COMPLETED 10/18/06	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
291.9								Ground Surface
291.9	0.0	5	3	5	942-1			291.9 — 0.0
288.9	3.0	10	13	13	942-2			289.9 — 2.0 Clayey SILT (MH) dark brown (7.5YR 3/4), moist, medium stiff, contains root fragments (Residual Soil)
283.8	8.1	28	44	44	942-3			Silty, fine to coarse SAND (SM) strong brown (7.5YR 4/6), moist, medium dense to very dense (Residual Soil)
282.3	9.6	36	50/0.5		942-4			281.8 — 10.1
279.9	12.0	12	50/0.5		942-5			Weathered Rock: Strong brown (7.5YR 4/6), dark yellowish brown (10YR 4/4), and very dark grayish brown (10YR 3/2), moist, very dense, severely weathered, QUARTZ-BIOTITE GNEISS
278.9	13.0	50/0.5			942-6			
273.4	18.5	39	50/0.2		942-7			
268.2	23.7	25	46	50/0.3	942-8			
264.1	27.8							
263.2	28.7	50/0.4			942-9			263.0 — 28.9
		50/0.2			942-10			261.1 — 30.8 Hard Rock: Dark gray, slightly weathered, close fracturing, very hard, QUARTZ-BIOTITE GNEISS
								Hard Rock: Dark gray, fresh, wide to very wide fracturing, very hard, QUARTZ-BIOTITE GNEISS with trace pyrite

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

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	COUNTY Louisa, VA	GEOLOGIST S. Nicely
SITE DESCRIPTION NORTH ANNA COL		GROUND WATER (ft)
BORING NO. B-942	DRILL METHOD: Mud Rotary/Core	SAMPLE METHODS: SPT/CORE
COLLAR ELEV. 291.9 ft (NAVD88)	NORTHING 3,909,615 US ft (NAD83)	EASTING 11,684,326 US ft (NAD83)
TOTAL DEPTH 100.8 ft	DRILL MACHINE CME 550 ATV	DRILLER: F. Cox (Knoxville 550)
DATE STARTED 10/16/06	COMPLETED 10/18/06	CORE BARREL TYPE: HQ 3 triple tube-wireline

GROUND WATER (ft)	
0 HR.	3.2
24 HR.	3.8

HAMMER TYPE 140 lbs Auto	

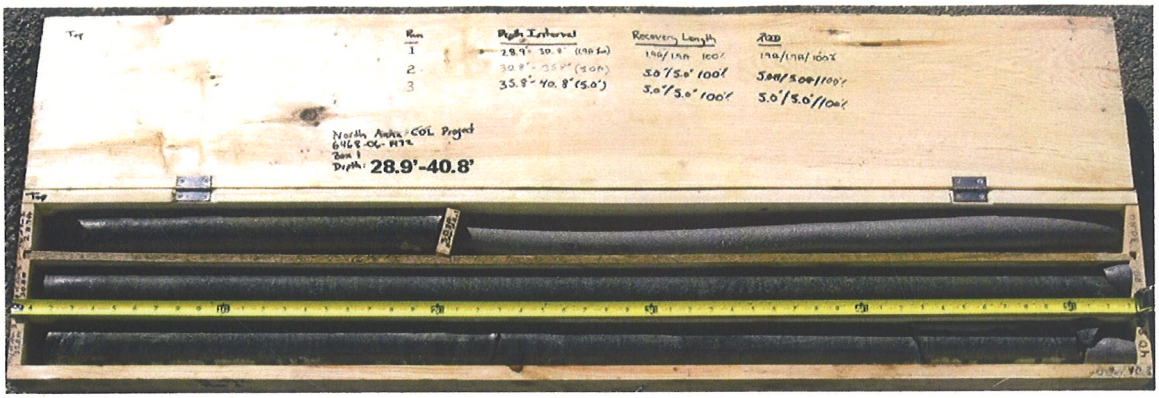
ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
217.0					Continued from previous page				
									Hard Rock: Dark gray, fresh, wide to very wide fracturing, very hard, QUARTZ-BIOTITE GNEISS with trace pyrite *(continued)*
									191.1 — 100.8
									Boring and coring terminated at 100.8 ft in Hard Rock: Very hard, QUARTZ-BIOTITE GNEISS

GEOTECHNICAL CORING LOG

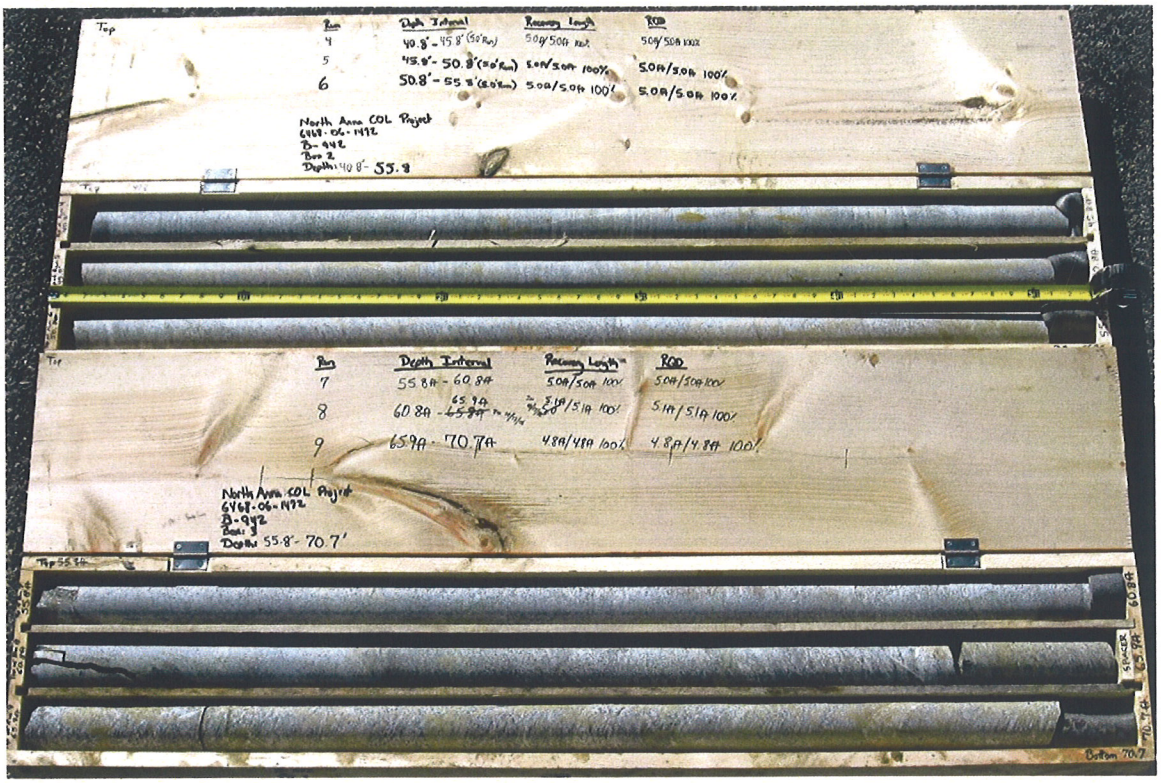
MACTEC

MACTEC PROJECT NO.: 6468-06-1472	COUNTY Louisa, VA	GEOLOGIST S. Nicely	
SITE DESCRIPTION NORTH ANNA COL			GROUND WATER (ft)
BORING NO. B-942	DRILL METHOD: Mud Rotary/Core	SAMPLE METHODS: SPT/CORE	0 HR. 3.2
COLLAR ELEV. 291.9 ft (NAVD88)	NORTHING 3,909,615 US ft (NAD83)	EASTING 11,684,326 US ft (NAD83)	24 HR. 3.8
TOTAL DEPTH 100.8 ft	DRILL MACHINE CME 550 ATV	DRILLER: F. Cox (Knoxville 550)	HAMMER TYPE 140 lbs Auto
DATE STARTED 10/16/06	COMPLETED 10/18/06	CORE BARREL TYPE: HQ 3 triple tube-wireline	
CORE SIZE HQ3	TOTAL RUN 71.9 ft		

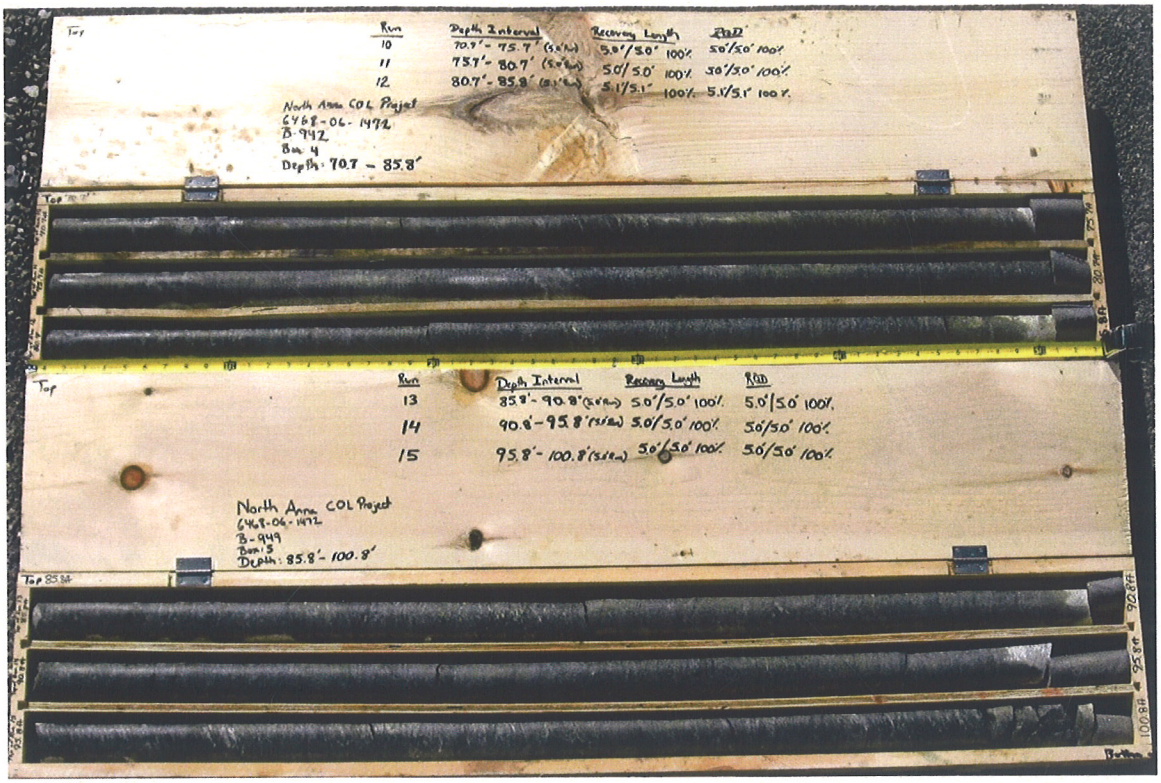
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 28.9 ft
263.0	28.9	1.9	2:58 7:11/0.9	(1.9) 100%	(1.9) 100%	1				263.0 Hard Rock: Dark gray, slightly weathered, close fracturing, very hard, QUARTZ-BIOTITE GNEISS 28.9
261.1	30.8	5.0	4:48 3:08 3:25 3:06 3:16	(5.0) 100%	(5.0) 100%	2				261.1 30.8 Hard Rock: Dark gray, fresh, wide to very wide fracturing, very hard, QUARTZ-BIOTITE GNEISS with trace pyrite -No Joints
256.1	35.8	5.0	3:02 3:12 2:52 3:00 2:59	(5.0) 100%	(5.0) 100%	3				-No Joints
251.1	40.8	5.0	2:57 2:58 2:25 2:55 2:52	(5.0) 100%	(5.0) 100%	4				-No Joints
246.1	45.8	5.0	2:11 2:37 2:43 2:06 2:37	(5.0) 100%	(5.0) 100%	5				-No Joints
241.1	50.8	5.0	2:40 2:50 2:47 2:15 2:54	(5.0) 100%	(5.0) 100%	6				-No Joints
236.1	55.8	5.0	2:57 3:17 2:41 2:34 2:50	(5.0) 100%	(5.0) 100%	7				-No Joints
231.1	60.8	5.1	2:53 2:45 2:58 3:02 2:53/1.1	(5.1) 100%	(5.1) 100%	8				-No Joints
226.0	65.9	4.8	2:52 3:23 3:27 2:37 2:44/0.8	(4.8) 100%	(4.8) 100%	9				-No Joints
221.2	70.7	5.0	3:28 2:59 3:29 2:58 3:26	(5.0) 100%	(5.0) 100%	10				(1 joint at 25°)
216.2	75.7	5.0	2:39 2:53 2:42 2:40 2:53	(5.0) 100%	(5.0) 100%	11				-No Joints
211.2	80.7	5.1	2:26 2:29 2:27 2:46 2:50/1.1	(5.1) 100%	(5.1) 100%	12				-No Joints
206.1	85.8	5.0	2:28 2:24 2:56 2:44 1:57	(5.0) 100%	(5.0) 100%	13				(1 joint at 20°)
201.1	90.8	5.0	2:18 2:11 2:04 2:27 2:32	(5.0) 100%	(5.0) 100%	14				-No Joints
196.1	95.8	5.0	2:20 2:27 2:24 2:47 2:37	(5.0) 100%	(5.0) 100%	15				-No Joints
191.1	100.8									191.1 100.8 Coring terminated at 100.8 ft in Hard Rock: Very hard, QUARTZ-BIOTITE GNEISS



B-942 – Box 1



B-942 – Box 2
B-942 – Box 3



B-942 – Box 4
B-942 – Box 5