



SHEET 1 OF 2

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.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION		
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			NO.	
254.0					Ground Surface							254.0	0.0	
252.8	1.2	26	19	7							939-1		Silty, fine to coarse SAND (SM) yellowish brown (10YR 5/6), moist, medium dense (Fill)	
250.2	3.8	4	6	9							939-2		Sandy CLAY (CL) yellowish brown (10YR 5/4), moist, stiff, silt (Fill)	3.5
247.7	6.3	6	6	9							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)	6.0
245.2	8.8	4	3	7							939-4			
242.7	11.3	3	3	7							939-5			
240.2	13.8	4	7	8							939-6			
235.3	18.7	3	7	7							939-7			
230.2	23.8	7	11	9							939-8			
225.2	28.8	5	7	5							939-9		Sandy SILT (ML) yellowish red (5YR 4/6), moist, stiff, clay (Fill)	26.0
220.2	33.8	3	3	5							939-10			
215.2	38.8	15	25	42							939-11		Silty, fine to coarse SAND (SM) brownish yellow (10YR 6/8), moist, very dense (Residual Soil)	38.0
210.2	43.8	27	48	50/0.3							939-12			44.8
205.2	48.8	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	
202.8	51.2	50/0.1									939-14			
192.8	61.2	50/0.4									939-15			
187.9	66.1	50/0.4									939-16			
182.9	71.1	50/0.2									939-17			

NORTH ANNA COL. L-RE NORTH ANNA COL. DATA REPORT REV0.GPJ NORTH ANNA COL.GDT 1/19/07

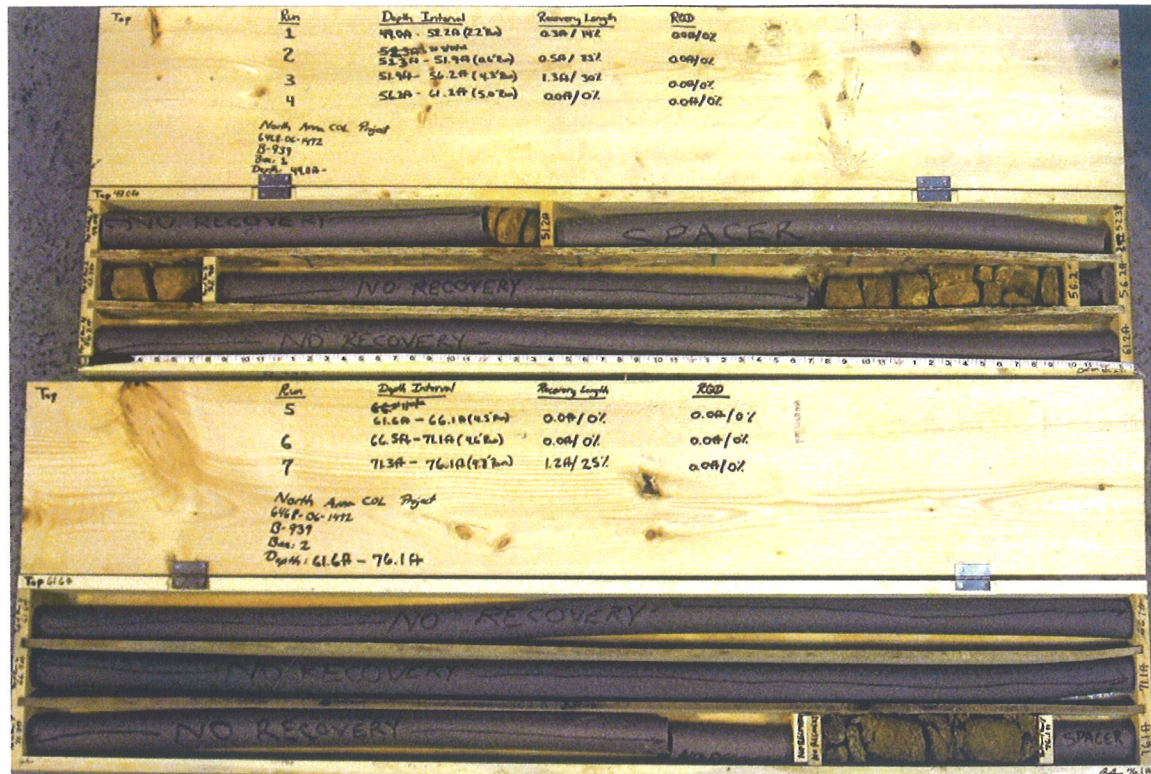


SHEET 2 OF 2

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			BLOWS PER FOOT						SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100					
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															

NORTH ANNA COL CORE NORTH ANNA COL DATA REPORT REV0 GP1 NORTH ANNA COL.GDT 1/19/07

2



B-939 - Box 1
B-939 - Box 2



SHEET 1 OF 2

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			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			
268.3					Ground Surface								268.3 0.0
													No samples due to utility clearance operations- soft dig/vac. truck excavation
260.5	7.8	14	28	40						940-1			260.5 7.8
257.3	11.0	11	15	22						940-2			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)
254.5	13.8	15	19	30						940-3			
249.8	18.5	50/0.0								940-4			
242.1	26.2	34	50	41						940-5			247.1 21.2
237.1	31.2	27	37	50/0.4						940-6			249.8 18.5
													247.1 21.2
													Hard Rock: dark gray, moderately weathered, very close to close fracturing, hard to soft, QUARTZ-BIOTITE GNEISS
													Weathered Rock: Dark brown and dark gray, severely weathered, very close to close fracturing, medium hard to very soft, QUARTZ-BIOTITE GNEISS
													234.7 33.6
													232.2 36.1
													228.2 40.1
													Hard Rock: Dark brown to light gray, moderately severe to moderately weathered, very close to close fracturing, soft to medium hard, QUARTZ-BIOTITE GNEISS
													Weathered Rock: Dark gray, severely weathered, very close to close fracturing, very soft to medium hard, QUART-BIOTITE GNEISS
													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

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



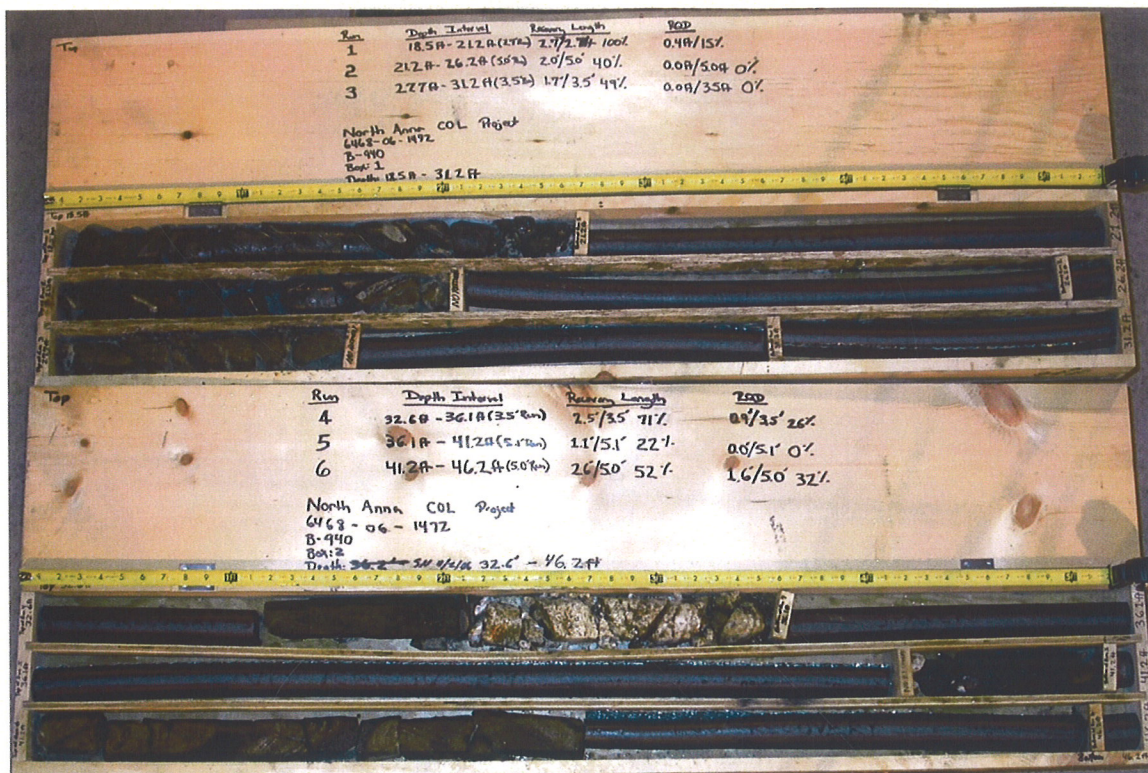
MACTEC PROJECT NO.: 6468-06-1472										COUNTY Louisa, VA					GEOLOGIST S. Nicely				
SITE DESCRIPTION NORTH ANNA COL															GROUND WATER (ft) 0 HR. 15.9 24 HR. ND				
BORING NO. B-940					DRILL METHOD: Mud Rotary/Core					SAMPLE METHODS: SPT/CORE									
COLLAR ELEV. 268.3 ft (NAVD88)					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					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			BLOWS PER FOOT						SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION					
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100									
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				



SHEET 1 OF 1

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)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	LOG	DESCRIPTION AND REMARKS		
										Begin Coring @ 18.5 ft		
249.8	18.5	2.7	N=50/0.0 3:24	(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		6:27							247.1	-Highly fractured with Fe and Mn staining, quartz vein at 20.3 ft 21.2	
		5.0	3:15/0.7 3:10 2:59 1:37 1:13 1:23 N=91	(2.0) 40%	(0.0) 0%	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					940-5						
240.6	27.7	3.5	4:18 1:50 1:34	(1.7) 49%	(0.0) 0%	3					-Highly fractured, no recovery from 27.7-31.2 ft	
237.1	31.2		0:42/0.5 N=50/0.4			940-6						
235.7	32.6	3.5	3:31 1:53	(2.5) 71%	(0.9) 26%	4				234.7	-Highly fractured quartz vein from 34.7-36.1 ft 33.6	
232.2	36.1		2:17/1.5							232.2	Hard Rock: Dark brown to light gray, moderately severe to moderately weathered, very close to close fracturing, soft to medium hard, QUARTZ-BIOTITE GNEISS 36.1	
		5.1	1:57 4:31 2:30 3:30 3:33/1.1	(1.1) 22%	(0.0) 0%	5					Weathered Rock: Dark gray, severely weathered, very close to close fracturing, very soft to medium hard, QUARTZ-BIOTITE GNEISS -Quartz vein from 36.1-36.2 ft, no recovery from 36.2-40.1 ft 40.1	
227.1	41.2										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 -Highly fractured, no recovery from 43.8-46.2 ft	
		5.0	2:29 3:06 2:41 3:16 3:11	(2.6) 52%	(1.6) 32%	6						
222.1	46.2										-Highly fractured; quartz vein at 49.6 ft and from 48.6-49.4 ft	
		5.0	3:24 3:09 1:59 2:44 1:51	(4.2) 84%	(0.0) 0%	7						
217.1	51.2										-Highly fractured; quartz vein from 54.2-54.4 ft	
		5.0	1:23 1:48 2:11 2:02 2:29	(4.1) 82%	(1.7) 34%	8						
212.1	56.2										(5 joints at 60-65°)	
		5.0	2:38 3:38 3:42 3:37 3:43	(4.8) 96%	(4.1) 82%	9					(2 joints at 10° with Fe staining; 1 joint at 50°; no recovery from 61.2-63.5 ft)	
207.1	61.2											
		5.0	1:46 1:17 1:16 1:27 2:49	(2.7) 54%	(1.9) 38%	10						
202.1	66.2									202.1	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) 66.2	
		4.9	2:34 3:42 3:38 4:17 3:58/0.9	(4.9) 100%	(4.7) 96%	11					(1 joint at 45°, 1 joint at 75°)	
197.2	71.1											
		5.0	3:12 3:15 3:12 3:31 3:02	(5.0) 100%	(4.2) 84%	12						
192.2	76.1									192.2	Coring terminated at 76.1 ft in Hard Rock: Hard to very hard, BIOTITE-QUARTZ GNEISS 76.1	

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



B-940 - Box 1
B-940 - Box 2



B-940 - Box 3
B-940 - Box 4



SHEET 1. OF 2

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			BLOWS PER FOOT						SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION				
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100								
267.2					Ground Surface										267.2	0.0		
258.7	8.5														258.7	8.5	No samples due to utility clearance operations- soft dig/ vac. truck excavation	
256.2	11.0	16	33	40							941-1						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)	
		17	42	50							941-2							
252.8	14.4	22	20	21							941-3							
247.8	19.4	33	32	50							941-4							
242.8	24.4	16	50/0.3								941-5							
237.8	29.4	26	50/0.2								941-6					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
233.7	33.5	50/0.2									941-7							
226.1	41.1	21	50/0.4								941-8							
220.8	46.4	11	15	33							941-9					222.2	45.0	Silty, fine to medium SAND (SM) very dark brown (10YR 2/2), moist, dense (Residual Soil)
															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	

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

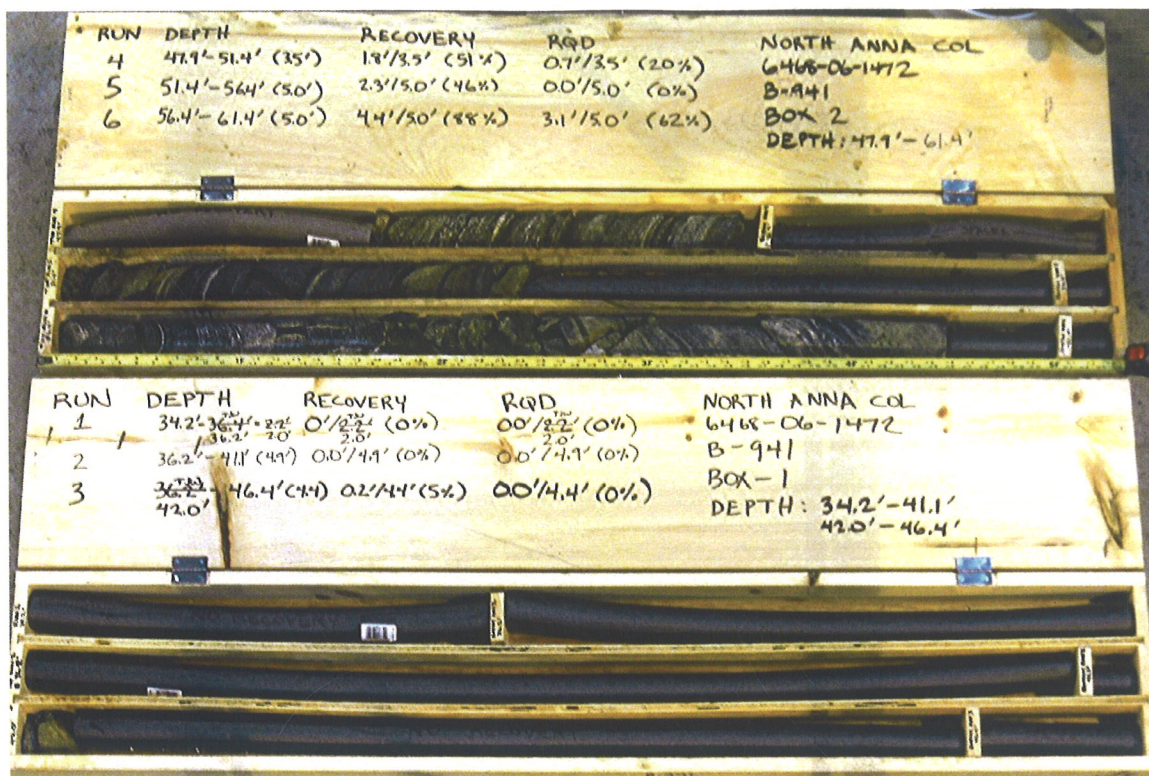
NORTH ANNA COL DUCKE NORTH ANNA COL DATA REPORT REV0.GPJ NORTH ANNA COL.GDT 1/19/07



SHEET 1 OF 1

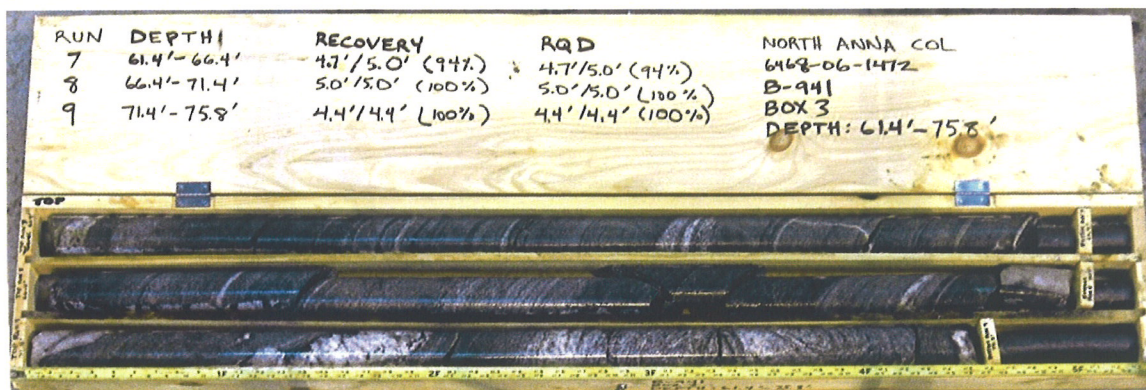
MACTEC PROJECT NO.: 6468-06-1472							COUNTY Louisa, VA				GEOLOGIST J. Lachewitz / J. Wallen			
SITE DESCRIPTION NORTH ANNA COL											GROUND WATER (ft)			
BORING NO. B-941			DRILL METHOD: Mud Rotary/Core				SAMPLE METHODS: SPT/CORE				0 HR. ND			
COLLAR ELEV. 267.2 ft (NAVD88)			NORTHING 3,910,404		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) %		ROD (ft) %	SAMP. NO.	STRATA REC. (ft) %		RQD (ft) %	L O G	DESCRIPTION AND REMARKS		
												Begin Coring @ 34.2 ft		
233.0	34.2	2.0	1:08	(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) -No Recovery -No Recovery		
231.0	36.2	4.9	1:19	0%	0%	2								
			0:56	(0.0)	(0.0)									
			1:05	0%	0%									
			1:16											
			1:32											
226.1	41.1		1:07/0.9			941-8								
			N=50/0.4											
225.2	42.0	4.4	2:43/1.1	(0.2)	(0.0)	3								
			2:37	5%	0%									
			2:42											
220.8	46.4		1:48/1.3											
			N=48			941-9								
219.3	47.9	3.5	2:16	(1.8)	(0.7)	4								
			1:40	51%	20%									
			1:32											
215.8	51.4	5.0	0:30/0.5	(2.3)	(0.0)	5								
			1:56	46%	0%									
			1:58											
			1:54											
210.8	56.4	5.0	2:52			6								
			2:00											
			2:16	(4.4)	(3.1)									
			2:23	88%	62%									
			3:40											
205.8	61.4	5.0	3:02			7								
			3:36											
			2:41	(4.7)	(4.7)									
			2:37	94%	94%									
			3:07											
200.8	66.4	5.0	1:21	(5.0)	(5.0)	8								
			1:34	100%	100%									
			2:14											
			1:14											
			1:42											
195.8	71.4	4.4	1:46	(4.4)	(4.4)	9								
			2:37	100%	100%									
			4:19											
			4:06											
			3:17											
191.4	75.8		4:58											
			3:08/0.4											
												Coring terminated at 75.8 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



B-941 - Box 2

B-941 - Box 1



B-941 - Box 3



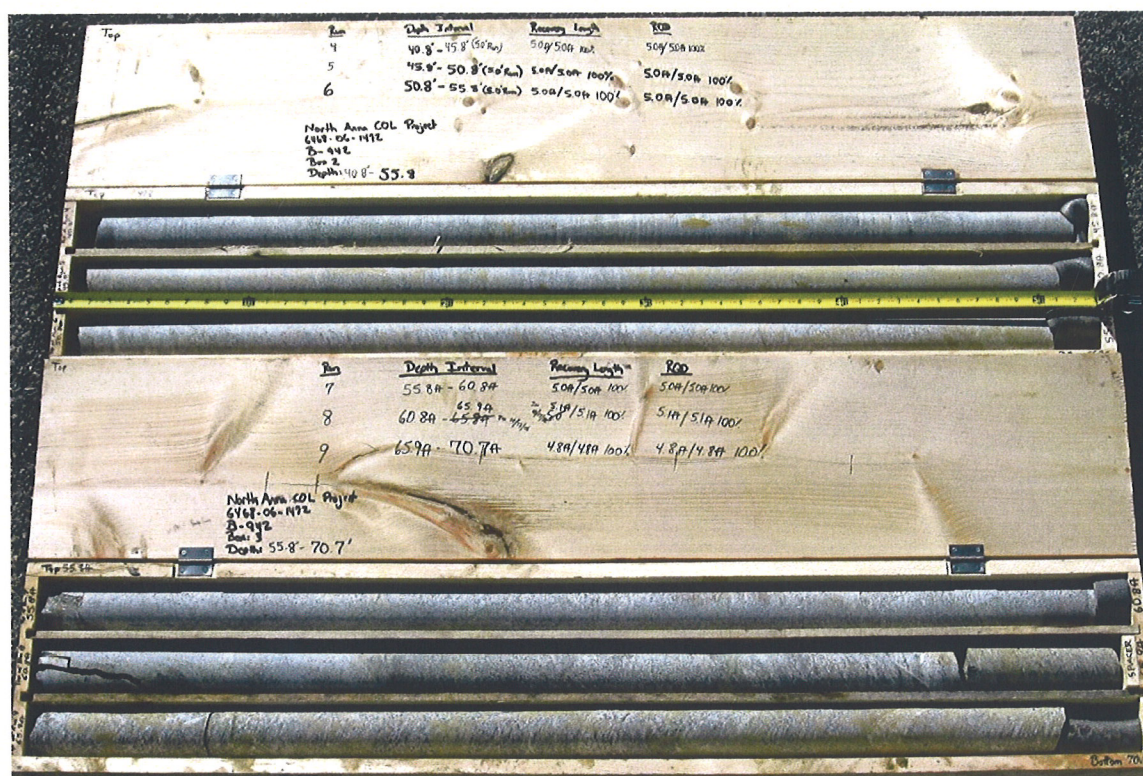
SHEET 1 OF 1

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

NORTH ANNA COL CORE NORTH ANNA COL DATA REPORT REV.0.GPJ NORTH ANNA COL.GDT 1/19/07



B-942 - Box 1



B-942 - Box 2

B-942 - Box 3



B-942 - Box 4

B-942 - Box 5