



## GEOTECHNICAL BORING LOG

Prepared By JSS Date 12/16/09Checked By NPL Date 12/16/09

SHEET 1 OF 3

BECHTEL PROJECT NO.: 25161			MACTEC PROJECT NO.: 6468-09-2473			COUNTY: Louisa, VA			GEOLOGIST: R. Clark			
SITE DESCRIPTION: North Anna 3 Project Supplement 2						DRILLER: T. Hahn/R. Hall			FLUID LEVEL (ft)			
BORING NO.: M-31			DRILL METHOD: Mud Rotary/Rock Core			DRILL MACHINE: CME-55 Track (RAL)			0 HR. NA			
GROUND ELEV.: 306.9 ft (NAVD88)			NORTHING: 3,909,799 US ft (NAD83)			EASTING: 11,685,460 US ft (NAD83)			24 HR. 27.8			
TOTAL DEPTH: 151.5 ft		SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08				ROD TYPE: AWJ		HAMMER (ID):140-lb. Auto (MEC-21)				
DATE STARTED: 9/10/09		COMPLETED: 9/16/09		HOLE DIA.: 4"		CASING DEPTH: 59.0 ft		CORE SIZE: HQ3		BITS USED: 3-7/8" Tri-Cone		
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			
306.9					Ground Surface							306.9 0.0
												No sampling from 0.0 to 9.1 feet due to soft dig utility clearance by Dominion Personnel
297.8	9.1	7	7	7								297.8 9.1
295.3	11.6	4	3	4								RESIDUAL SOIL: Silty SAND (SM), brownish yellow (10YR 6/6), medium dense, moist, fine grained sand, little mica, relict rock fabric
293.0	13.9	7	6	6								11.6 ft: Loose
												13.9 ft: Brownish yellow (10YR 6/8), medium dense
288.0	18.9	6	5	6								
283.0	23.9	50/0.4										283.9 23.0
												281.9 25.0
277.9	29.0	10	10	11								WEATHERED ROCK: Severely weathered BIOTITE QUARTZ GNEISS (Sampled as Silty SAND (SM), brownish yellow (10YR 6/6), very dense, moist, fine to medium grained sand, little mica)
272.9	34.0	12	11	11								RESIDUAL SOIL: Silty SAND (SM), pale yellow (2.5Y 7/4), medium dense, moist, fine to medium grained sand, little mica, relict rock fabric
												34.0 ft: Fine to coarse grained sand
267.9	39.0	7	8	10								39.0 ft: Yellow (10YR 7/6)
262.9	44.0	19	22	24								44.0 ft: Dense, moist to wet
257.9	49.0	43	50/0.3									259.9 47.0
												255.9 51.0
252.9	54.0	20	19	18								WEATHERED ROCK: Severely weathered BIOTITE QUARTZ GNEISS (Sampled as Silty SAND (SM), pale yellow (2.5Y 7/3), very dense, moist to wet, fine to coarse grained sand)
												RESIDUAL SOIL: Silty SAND (SM), pale yellow (2.5Y 7/3), dense, wet, fine to coarse grained sand, relict rock fabric
247.9	59.0	50/0.0										58.7 ft: Very hard drilling
												59.0 ft: SPT Refusal with no penetration
												HARD ROCK: Light gray with orange staining, slightly to very slightly weathered, moderately close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS
												248.2 58.7
												240.4 66.5
												HARD ROCK: Light gray with trace pink and dark gray, fresh, close to wide fracturing, hard to very hard, BIOTITE QUARTZ GNEISS with trace magnetite

NORTH ANNA 3 BORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/4/09



BECHTEL PROJECT NO.: 25161		MACTEC PROJECT NO.: 6468-09-2473		COUNTY: Louisa, VA		GEOLOGIST: R. Clark						
SITE DESCRIPTION: North Anna 3 Project Supplement 2				DRILLER: T. Hahn/R. Hall		FLUID LEVEL (ft)						
BORING NO.: M-31		DRILL METHOD: Mud Rotary/Rock Core		DRILL MACHINE: CME-55 Track (RAL)		0 HR. NA						
GROUND ELEV.: 306.9 ft (NAVD88)		NORTHING: 3,909,799 US ft (NAD83)		EASTING: 11,685,460 US ft (NAD83)		24 HR. 27.8						
TOTAL DEPTH: 151.5 ft		SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08		ROD TYPE: AWJ		HAMMER (ID): 140-lb. Auto (MEC-21)						
DATE STARTED: 9/10/09		COMPLETED: 9/16/09		HOLE DIA.: 4"		CASING DEPTH: 59.0 ft						
				CORE SIZE: HQ3		BITS USED: 3-7/8" Tri-Cone						
ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft 0.5ft 0.5ft			BLOWS PER FOOT 0 20 40 60 80 100					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION
232.1					Continued from previous page							
HARD ROCK: Light gray with trace pink and dark gray, fresh, close to wide fracturing, hard to very hard, BIOTITE QUARTZ GNEISS with trace magnetite (continued)												

NORTH ANNA 3 BORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/4/09



BECHTEL PROJECT NO.: 25161					MACTEC PROJECT NO.: 6468-09-2473					COUNTY: Louisa, VA			GEOLOGIST: R. Clark			
SITE DESCRIPTION: North Anna 3 Project Supplement 2										DRILLER: T. Hahn/R. Hall				FLUID LEVEL (ft)		
BORING NO.: M-31					DRILL METHOD: Mud Rotary/Rock Core					DRILL MACHINE: CME-55 Track (RAL)				0 HR. NA		
GROUND ELEV.: 306.9 ft (NAVD88)					NORTHING: 3,909,799 US ft (NAD83)					EASTING: 11,685,460 US ft (NAD83)				24 HR. 27.8		
TOTAL DEPTH: 151.5 ft			SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08							ROD TYPE: AWJ		HAMMER (ID): 140-lb. Auto (MEC-21)				
DATE STARTED: 9/10/09			COMPLETED: 9/16/09			HOLE DIA.: 4"		CASING DEPTH: 59.0 ft		CORE SIZE: HQ3		BITS USED: 3-7/8" Tri-Cone				
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						
157.3					Continued from previous page											
													155.4	151.5		
													Boring and coring terminated at 151.5 feet.			
													Boring closed by tremie method with cement-bentonite grout.			
													24 hour water level measured on 9/16/2009 prior to drilling. Borehole was at a depth of 141.5 feet.			

NORTH ANNA 3 BORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/4/09



SHEET 1 OF 2

BECHTEL PROJECT NO.: 25161		MACTEC PROJECT NO.: 6468-09-2473		COUNTY: Louisa, VA		GEOLOGIST: R. Clark	
SITE DESCRIPTION: North Anna 3 Project Supplement 2				DRILLER: T. Hahn/R. Hall		FLUID LEVEL (ft)  0 HR. NA  24 HR. 27.8	
BORING NO.: M-31		DRILL METHOD: Mud Rotary/Rock Core		DRILL MACHINE: CME-55 Track (RAL)			
GROUND ELEV.: 306.9 ft (NAVD88)		NORTHING: 3,909,799 US ft (NAD83)		EASTING: 11,685,460 US ft (NAD83)			
TOTAL DEPTH: 151.5 ft		SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08				HAMMER (ID): 140-lb. Auto (MEC-21)	
DATE STARTED: 9/10/09		COMPLETED: 9/16/09	CASING DEPTH: 59.0 ft	CORE BARREL TYPE: Wireline HQ3 Triple Tube, series 6 & 10 bits			

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		L O G	DESCRIPTION AND REMARKS
				REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %		
										Begin Coring @ 59.0 ft
247.9	59.0	2.5	N=50/0.0 3:01 3:21	(2.5) 100%	(1.3) 52%	RUN 1	(7.5) 100%	(6.3) 84%		HARD ROCK: Light gray with orange staining, slightly to very slightly weathered, moderately close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS ( <i>continued</i> )
245.4	61.5	5.0	1:51/0.5 3:02 3:05 4:09 2:23 2:54	(5.0) 100%	(5.0) 100%	RUN 2				(3 joints at 10°, tight with iron staining; 2 joints at 80°, tight) (2 joints at 0°, tight to open with iron staining; 1 joint at 45°, tight)
240.4	66.5	2.3	3:49 8:32 4:21/0.3	(2.3) 100%	(2.3) 100%	RUN 3	(84.6) 100%	(83.0) 98%		240.4 HARD ROCK: Light gray with trace pink and dark gray, fresh, close to wide fracturing, hard to very hard, BIOTITE QUARTZ GNEISS with trace magnetite
238.1	68.8	2.7	3:08/0.7 3:35 3:42	(2.7) 100%	(2.7) 100%	RUN 4				(No Joints) (No Joints)
235.4	71.5	5.0	3:21 3:33 3:28 3:33 2:45	(5.0) 100%	(5.0) 100%	RUN 5				(1 joint at 15°, tight with trace iron staining)
230.4	76.5	3.0	3:38 4:14 5:05	(3.0) 100%	(3.0) 100%	RUN 6				(No Joints)
227.4	79.5	2.0	3:58 4:54	(1.7) 85%	(1.7) 85%	RUN 7				(2 joints at 30°, tight top open with iron staining)
225.4	81.5	5.0	4:45 5:15 4:15 3:05 4:01	(5.0) 100%	(3.7) 74%	RUN 8				(2 joints at 0°, tight with iron staining; 2 joints at 90°, tight)
220.4	86.5	5.0	4:17 3:33 3:33 3:41 4:05	(5.0) 100%	(4.7) 94%	RUN 9				(1 joint at 30°, tight; 1 joint at 45°, open with iron staining; 1 joint at 75°, open with iron staining)
215.4	91.5	5.0	6:12 6:51 3:05 3:11 3:18	(5.0) 100%	(5.0) 100%	RUN 10				(1 joint at 0°, open)
210.4	96.5	5.0	2:45 3:04 2:55 3:59 4:01	(5.0) 100%	(5.0) 100%	RUN 11				(1 joint at 90°, tight)
205.4	101.5	5.0	3:04 3:55 3:56 4:27 4:55	(5.0) 100%	(5.0) 100%	RUN 12				(No Joints)
200.4	106.5	5.0	5:46 7:12 3:52 3:12 3:24	(5.0) 100%	(5.0) 100%	RUN 13				(Pegmatitic quartz + feldspar vein at 108.5 ft)
195.4	111.5	5.0	2:29 2:33 2:45 3:01 3:08	(5.0) 100%	(5.0) 100%	RUN 14				(No Joints)
190.4	116.5	5.0	3:05 3:33 4:04 4:18 4:22	(5.0) 100%	(5.0) 100%	RUN 15				(3 joints at 0°, tight with iron staining and slight weathering)
185.4	121.5	5.0	4:18 4:22 2:35 2:28 2:01	(5.0) 100%	(5.0) 100%	RUN 16				(2 joints at 0°, tight; 1 joint at 20°, tight; 2 joints at 85-90°, tight with iron staining; pegmatitic quartz + feldspar vein at 30° at end of run)
180.4	126.5	5.0	2:58 3:05 2:02 2:33 2:55	(5.0) 100%	(5.0) 100%	RUN 17				(No Joints)
175.4	131.5	5.0	2:25 2:33	(5.0) 100%	(5.0) 100%	RUN 18				(No Joints)

NORTH ANNA 3 CORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/4/09



SHEET 2 OF 2

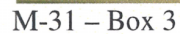
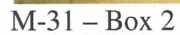
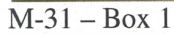
BECHTEL PROJECT NO.: 25161				MACTEC PROJECT NO.: 6468-09-2473				COUNTY: Louisa, VA				GEOLOGIST: R. Clark			
SITE DESCRIPTION: North Anna 3 Project Supplement 2								DRILLER: T. Hahn/R. Hall				FLUID LEVEL (ft) 0 HR. NA 24 HR. 27.8			
BORING NO.: M-31				DRILL METHOD: Mud Rotary/Rock Core				DRILL MACHINE: CME-55 Track (RAL)							
GROUND ELEV.: 306.9 ft (NAVD88)				NORTHING: 3,909,799 US ft (NAD83)				EASTING: 11,685,460 US ft (NAD83)							
TOTAL DEPTH: 151.5 ft				SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08								HAMMER (ID): 140-lb. Auto (MEC-21)			
DATE STARTED: 9/10/09				COMPLETED: 9/16/09				CASING DEPTH: 59.0 ft				CORE BARREL TYPE: Wireline HQ3 Triple Tube, series 6 & 10 bits			

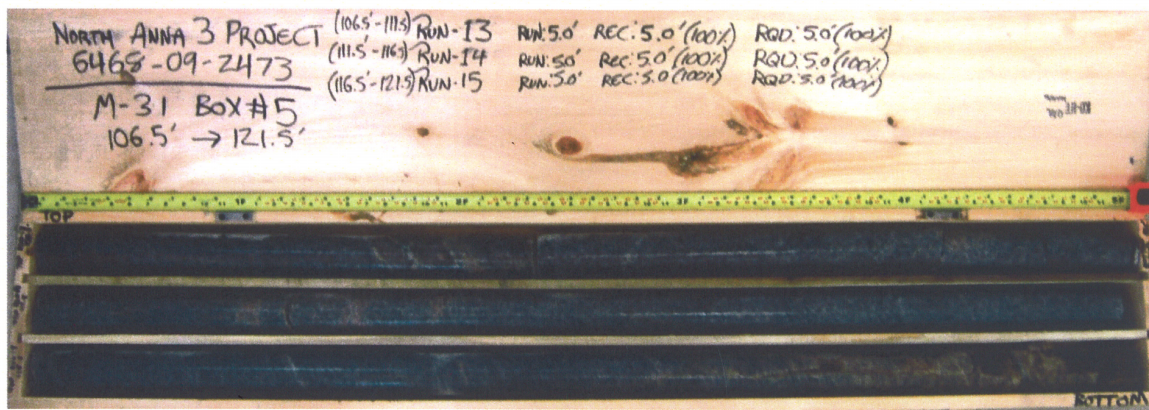
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS
				REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %		
										Continued from previous page
170.4	136.5		3:05 3:30 3:36							
		5.0	4:57 2:28 2:45 2:41 2:33	(5.0) 100%	(5.0) 100%	RUN 19				
165.4	141.5									
		5.0	2:30 2:34 3:02 3:09 3:40	(4.9) 98%	(4.9) 98%	RUN 20				
160.4	146.5									
		5.0	2:34 2:44 2:50 3:24 3:42	(5.0) 100%	(5.0) 100%	RUN 21				
155.4	151.5									155.4 151.5
Boring and coring terminated at 151.5 feet.  Boring closed by tremie method with cement-bentonite grout.  24 hour water level measured on 9/16/2009 prior to drilling. Borehole was at a depth of 141.5 feet.										

NORTH ANNA 3 CORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/4/09





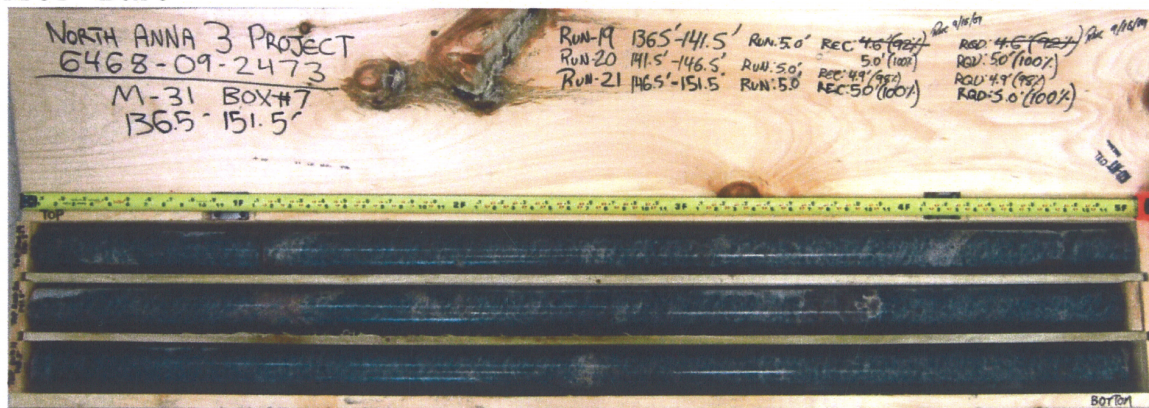




M-31 - Box 5



M-31 - Box 6



M-31 - Box 7



BECHTEL PROJECT NO.: 25161				MACTEC PROJECT NO.: 6468-09-2473				COUNTY: Louisa, VA				GEOLOGIST: R. Clark					
SITE DESCRIPTION: North Anna 3 Project Supplement 2								DRILLER: F. Cox/R. Hall				FLUID LEVEL (ft)					
BORING NO.: M-32				DRILL METHOD: Mud Rotary/Rock Core				DRILL MACHINE: CME-55 Track (RAL)				0 HR.		25.5			
GROUND ELEV.: 313.2 ft (NAVD88)				NORTHING: 3,909,876 US ft (NAD83)				EASTING: 11,685,527 US ft (NAD83)				24 HR.		32.5			
TOTAL DEPTH: 62.2 ft				SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08				ROD TYPE: AWJ				HAMMER (ID):140-lb. Auto (MEC-21)					
DATE STARTED: 9/28/09				COMPLETED: 9/28/09		HOLE DIA.: 4"		CASING DEPTH: 9.6 ft		CORE SIZE: NQ3		BITS USED: 3-7/8" Tri-Cone					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION				
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100							
313.2					Ground Surface								313.2	0.0			
														No sampling from 0.0 to 9.6 feet due to soft dig utility clearance by Dominion Personnel			
303.6	9.6										SS-1		303.6	9.6			
301.2	12.0	3	3	3							SS-2			RESIDUAL SOIL: Sandy SILT (ML), reddish yellow (5YR 6/6), medium stiff, moist, fine grained sand, some mica, relict rock fabric			
298.8	14.4	2	2	3							SS-3			14.4 ft: Yellowish red (5YR 5/8)			
		2	2	4													
294.6	18.6										SS-4						
		1	2	3													
289.5	23.7										SS-5			23.7 ft: Yellow red (5YR 5/6), soft, few mica			
		1	2	2													
284.6	28.6										SS-6			284.6			
		2	2	4										RESIDUAL SOIL: Silty SAND (SM), yellowish red (5YR 5/6), loose, moist, fine grained sand, some mica, relict rock fabric			
279.6	33.6										SS-7			33.6 ft: Wet, few mica			
		2	2	3													
274.6	38.6										SS-8			38.6 ft: Yellowish brown (10YR 5/4) with very dark gray (10YR 3/1) streaks, moist to wet, some mica			
		2	4	6													
269.6	43.6										SS-9			43.6 ft: Olive gray (5Y 5/2), medium dense, wet			
		3	6	8													
264.6	48.6										SS-10			264.6			
		11	28	50/0.3										WEATHERED ROCK: Severely weathered BIOTITE QUARTZ GNEISS (Sampled as Silty SAND (SM), olive gray (5Y 5/2) to olive (5Y 5/3), very dense, wet, fine to medium grained sand, some mica, few quartz fragments)			
259.6	53.6										SS-11						
		50/0.3															
256.0	57.2										SS-12			256.0			
		50/0.0												57.2 ft: SPT Refusal with no penetration			
														HARD ROCK: Light gray, slightly weathered to fresh, moderately close fracturing, very hard, BIOTITE QUARTZ GNEISS			
														251.0			
														62.2			
														Boring and coring terminated at 62.2 feet.			
														Boring closed by tremie method with cement-bentonite grout.			

NORTH ANNA 3 BORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/3/09





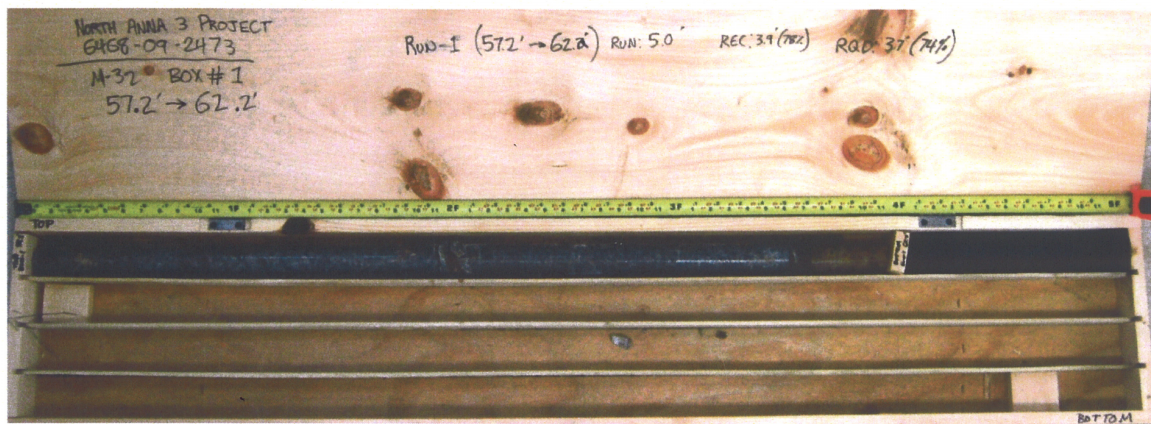
SHEET 1 OF 1

BECHTEL PROJECT NO.: 25161				MACTEC PROJECT NO.: 6468-09-2473				COUNTY: Louisa, VA				GEOLOGIST: R. Clark			
SITE DESCRIPTION: North Anna 3 Project Supplement 2								DRILLER: F. Cox/R. Hall				FLUID LEVEL (ft)			
BORING NO.: M-32				DRILL METHOD: Mud Rotary/Rock Core				DRILL MACHINE: CME-55 Track (RAL)				0 HR. 25.5			
GROUND ELEV.: 313.2 ft (NAVD88)				NORTHING: 3,909,876 US ft (NAD83)				EASTING: 11,685,527 US ft (NAD83)				24 HR. 32.5			
TOTAL DEPTH: 62.2 ft				SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08								HAMMER (ID): 140-lb. Auto (MEC-21)			
DATE STARTED: 9/28/09				COMPLETED: 9/28/09				CASING DEPTH: 9.6 ft				CORE BARREL TYPE: Wireline NQ3 Triple Tube, series 6 bit			

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS
				REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %		
										Begin Coring @ 57.2 ft
256.0	57.2	5.0	N=50/0.0 1:20 2:50 3:11 2:36 3:45	(3.9) 78%	(3.7) 74%	RUN 1	(3.9) 78%	(3.7) 74%		256.0 HARD ROCK: Light gray, slightly weathered to fresh, moderately close fracturing, very hard, BIOTITE QUARTZ GNEISS (4 joints at 10°, tight with iron staining) 57.2
251.0	62.2									251.0 62.2
Boring and coring terminated at 62.2 feet.										
Boring closed by tremie method with cement-bentonite grout.										

NORTH ANNA 3 CORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/3/09



M-32 – Box 1

# GEOTECHNICAL BORING LOG

Prepared By JSS Date 12/16/09

Checked By NPK Date 12/16/09

SHEET 1 OF 1

BECHTEL PROJECT NO.: 25161				MACTEC PROJECT NO.: 6468-09-2473				COUNTY: Louisa, VA				GEOLOGIST: K. Lloyd			
SITE DESCRIPTION: North Anna 3 Project Supplement 2								DRILLER: D. White/O. Smith				FLUID LEVEL (ft)			
BORING NO.: M-33				DRILL METHOD: Mud Rotary				DRILL MACHINE: CME-55LC Track (RAL)				0 HR.		ND	
GROUND ELEV.: 303.8 ft (NAVD88)				NORTHING: 3,909,984 US ft (NAD83)				EASTING: 11,685,615 US ft (NAD83)				24 HR.		ND	
TOTAL DEPTH: 64.9 ft		SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08						ROD TYPE: AWJ		HAMMER (ID):140-lb. Auto (MEC-02)					
DATE STARTED: 9/28/09		COMPLETED: 9/28/09		HOLE DIA.: 4"		CASING DEPTH: 8.7 ft		CORE SIZE: NA		BITS USED: 3-7/8" Tri-Cone					
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	MOI	LOG	SOIL AND ROCK DESCRIPTION		
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100					NO.
303.8					Ground Surface								303.8	0.0	
294.7	9.1												294.7	9.1	
292.3	11.5	2	3	3						SS-1			RESIDUAL SOIL: SILT with Sand (ML), yellowish red (5YR 5/8), medium stiff, moist, fine grained sand, some mica, little to some black staining, relict rock fabric		
289.7	14.1	2	2	3						SS-2					
		2	3	3						SS-3					
284.6	19.2	2	3	5						SS-4					
279.7	24.1	3	5	6						SS-5			281.8	22.0	
274.7	29.1	4	5	6						SS-6			279.0	24.8	
269.7	34.1	5	8	10						SS-7			RESIDUAL SOIL: Silty SAND (SM), medium dense, moist, fine grained sand, some mica, relict rock fabric		
264.7	39.1	10	13	16						SS-8			RESIDUAL SOIL: SILT with Sand (ML), yellowish red (5YR 5/8), stiff, moist, fine grained sand, some mica, relict rock fabric		
259.7	44.1	28	50/0.5							SS-9			29.1 ft: Dark greenish gray (10GY 4/1)		
254.7	49.1	36	50/0.3							SS-10			271.8	32.0	
249.7	54.1	41	50/0.3							SS-11			RESIDUAL SOIL: Sandy SILT (ML), dark greenish gray (10GY 4/1), very stiff, moist, fine grained sand, some mica, relict rock fabric		
244.7	59.1	59	41/0.1							SS-12			39.1 ft: Very dark greenish gray (5GY 5/1) and dark yellowish brown (10YR 4/6), fine to coarse grained sand		
239.7	64.1	44	50/0.3							SS-13			261.8	42.0	
													42.0 ft: Hard Drilling		
													WEATHERED ROCK: Severely weathered BIOTITE GNEISS (Sampled as Silty SAND (SM), very dark greenish gray (5GY 3/1), very dense, moist, fine to coarse grained sand, some mica, relict rock fabric)		
													49.1 ft: Severely weathered BIOTITE GNEISS (Sampled as Sandy SILT (ML), very dark greenish gray (5GY 3/1), hard, moist, fine to coarse grained sand, some mica, relict rock fabric)		
													59.1 ft: Severely weathered BIOTITE GNEISS (Sampled as Silty SAND (SM), black (10YR 2/1), very dense, moist, fine to coarse grained sand, some mica, relict rock fabric)		
													Boring terminated at 64.9 feet.		
													Boring closed by tremie method with cement-bentonite grout.		
													No 24 HR fluid level because boring grouted same day boring drilled.		

NORTH ANNA 3 BORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/4/09



## GEOTECHNICAL BORING LOG

Prepared By JSS Date 12/16/09Checked By MAN Date 12/16/09

SHEET 1 OF 1


BECHTEL PROJECT NO.: 25161		MACTEC PROJECT NO.: 6468-09-2473		COUNTY: Louisa, VA		GEOLOGIST: K. Lloyd							
SITE DESCRIPTION: North Anna 3 Project Supplement 2				DRILLER: D. White/O. Smith		FLUID LEVEL (ft)							
BORING NO.: M-34		DRILL METHOD: Mud Rotary		DRILL MACHINE: CME-55LC Track (RAL)		0 HR. NA							
GROUND ELEV.: 280.9 ft (NAVD88)		NORTHING: 3,910,122 US ft (NAD83)		EASTING: 11,685,736 US ft (NAD83)		24 HR. 13.0							
TOTAL DEPTH: 63.0 ft		SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08		ROD TYPE: AWJ		HAMMER (ID): 140-lb. Auto (MEC-02)							
DATE STARTED: 9/28/09		COMPLETED: 9/29/09		HOLE DIA.: 4"		CASING DEPTH: 8.7 ft							
				CORE SIZE: HQ3		BITS USED: 3-7/8" Tri-Cone							
ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft 0.5ft 0.5ft			BLOWS PER FOOT 0 20 40 60 80 100					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	
280.9					Ground Surface							280.9	0.0
												No sampling from 0.0 to 11.1 feet due to soft dig utility clearance by Dominion Personnel	
269.8	11.1									SS-1		269.8	11.1
267.3	13.6	3	4	5						SS-2		267.9	13.0
		2	3	4								264.9	16.0
262.1	18.8									SS-3		RESIDUAL SOIL: Sandy SILT with Gravel (ML), brownish yellow (10YR 6/8), medium stiff, moist, fine to coarse grained sand, little gravel sized rock fragments, some mica	
257.1	23.8	7	9	11						SS-4		RESIDUAL SOIL: Sandy SILT (ML), dark yellowish brown (10YR 3/6) and black (10YR 2/1), very stiff, moist, fine grained sand, some mica, relict rock fabric	
252.1	28.8	4	6	10						SS-5		28.8 ft: Dark yellowish brown (10YR 3/6) and very dark greenish gray (10GY 3/1), hard	
247.1	33.8	12	25	47						SS-6		248.9	32.0
		27	50/0.5							SS-7		WEATHERED ROCK: Severely weathered BIOTITE GNEISS (Sampled as Sandy SILT (ML), very dark greenish gray (10GY 3/1), hard, moist, fine grained sand, some mica, relict rock fabric)	
242.1	38.8	25	50/0.4							SS-8		237.0	43.9
237.0	43.9	50/0.2										HARD ROCK and WEATHERED ROCK: Black, severely to moderately severely weathered, close fracturing, soft to medium hard, BIOTITE GNEISS	
												227.9	53.0
												HARD ROCK: Black, moderately severe to slightly weathered, close to moderately close fracturing, moderately hard to hard, BIOTITE GNEISS	
												217.9	63.0
												Boring and coring terminated at 63.0 feet.	
												Boring closed by tremie method with cement-bentonite grout.	
												24 hour water level measured on 9/29/2009 prior to drilling. Borehole was at a depth of 44.0 feet.	

NORTH ANNA 3 BORE, NORTH ANNA 3 PROJECT.GPJ, NORTH ANNA 3.GDT, 12/16/09

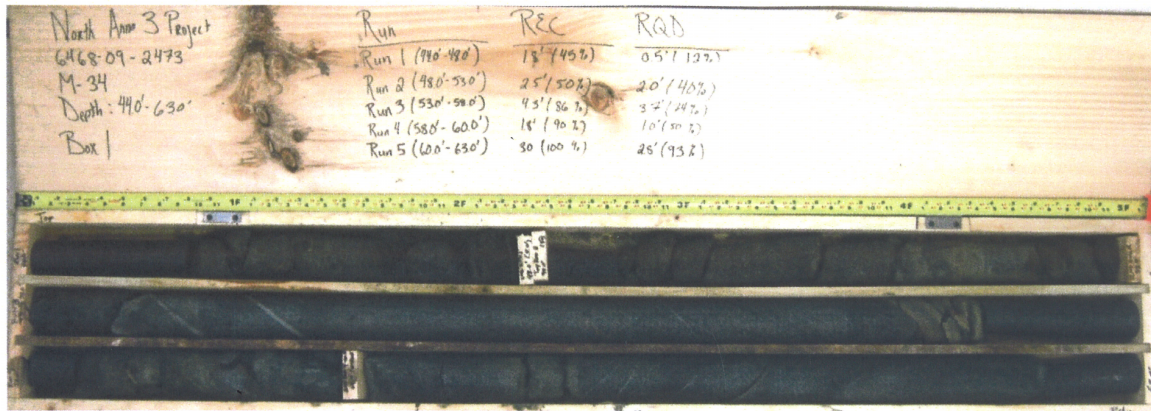




SHEET 1 OF 1

BECHTEL PROJECT NO.: 25161				MACTEC PROJECT NO.: 6468-09-2473				COUNTY: Louisa, VA		GEOLOGIST: K. Lloyd			
SITE DESCRIPTION: North Anna 3 Project Supplement 2								DRILLER: D. White/O. Smith		FLUID LEVEL (ft)			
BORING NO.: M-34				DRILL METHOD: Mud Rotary				DRILL MACHINE: CME-55LC Track (RAL)		0 HR.	NA		
GROUND ELEV.: 280.9 ft (NAVD88)				NORTHING: 3,910,122 US ft (NAD83)				EASTING: 11,685,736 US ft (NAD83)		24 HR.	13.0		
TOTAL DEPTH: 63.0 ft			SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08						HAMMER (ID): 140-lb. Auto (MEC-02)				
DATE STARTED: 9/28/09			COMPLETED: 9/29/09		CASING DEPTH: 8.7 ft		CORE BARREL TYPE: Wireline HQ3 Triple Tube, series 6 bit						
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %RQD (ft) %		SAMP. NO.	STRATA REC. (ft) %RQD (ft) %		L O G	DESCRIPTION AND REMARKS			
										Begin Coring @ 44.0 ft			
236.9	44.0	4.0	0:26 1:30 1:54 1:46	(1.8) 45%	(0.5) 13%	RUN 1	(4.3) 48%	(2.5) 28%		HARD ROCK and WEATHERED ROCK: Black, severely to moderately severely weathered, close fracturing, soft to medium hard, BIOTITE GNEISS (continued) (Several joints at 0-10°, open) (3 joints at 0-10°, open; 1 joint at 20°, open)			
232.9	48.0	5.0	1:42 2:15 2:12 2:14 1:30	(2.5) 50%	(2.0) 40%	RUN 2							
227.9	53.0	5.0	2:13 2:39 2:17 2:27 2:06	(4.3) 86%	(3.7) 74%	RUN 3	(9.1) 91%	(7.5) 75%				227.9	53.0
222.9	58.0	2.0	4:23 10:41	(1.8) 90%	(1.0) 50%	RUN 4							
220.9	60.0	3.0	2:04 1:58 2:15	(3.0) 100%	(2.8) 93%	RUN 5							
217.9	63.0								217.9	63.0			
Boring and coring terminated at 63.0 feet.													
Boring closed by tremie method with cement-bentonite grout.													
24 hour water level measured on 9/29/2009 prior to drilling. Borehole was at a depth of 44.0 feet.													

NORTH ANNA 3 CORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/3/09



M-34 – Box 1