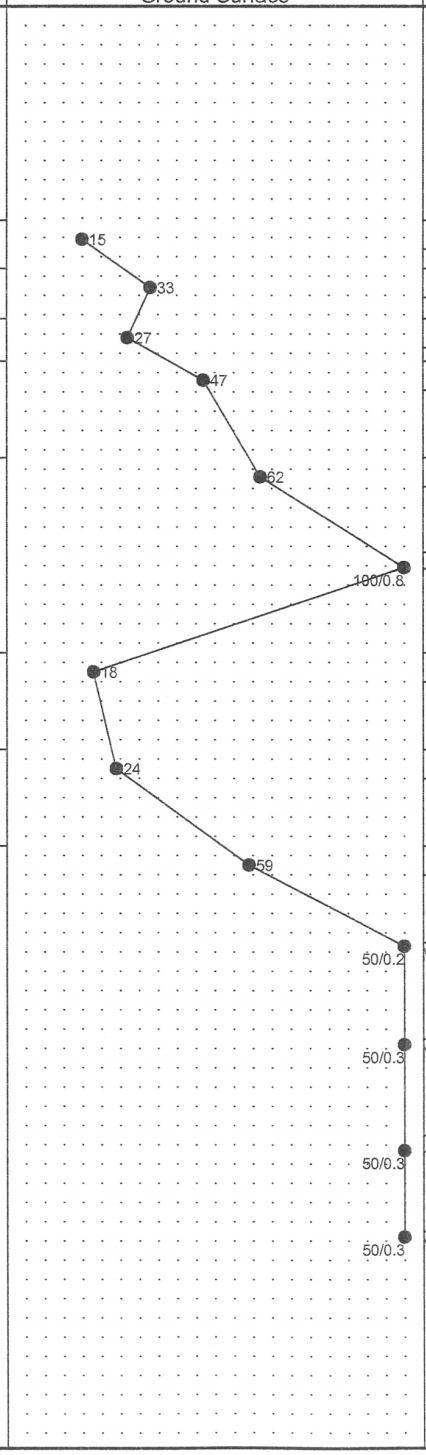
MACTEC

GEOTECHNICAL BORING LOG

Prepared By JSJ Date 12/16/09
Checked By MM Date 12/16/09

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: F. Cox/R. Hall	FLUID LEVEL (ft)
BORING NO.: M-21	DRILL METHOD: Mud Rotary/Rock Core	DRILL MACHINE: CME-55 Track (RAL)	0 HR. 10.5
GROUND ELEV.: 303.9 ft (NAVD88)	NORTHING: 3,909,811 US ft (NAD83)	EASTING: 11,686,270 US ft (NAD83)	24 HR. 29.5
TOTAL DEPTH: 151.8 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: 9/22/09	COMPLETED: 9/24/09	HOLE DIA.: 4"	CASING DEPTH: 63.8 ft
CORE SIZE: HQ3	BITS USED: 3-7/8" Tri-Cone		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	SAMP. NO.	SOIL AND ROCK DESCRIPTION
303.9						Ground Surface
						303.9 / 0.0: No sampling from 0.0 to 11.1 feet due to soft dig utility clearance by Dominion Personnel
292.8	11.1					292.8 / 11.1
290.3	13.6	5	9	6	SS-1	292.4 / 11.5: RESIDUAL SOIL: Silty SAND (SM), light yellowish brown (10YR 6/4), moist, medium dense (Disturbed material from soft dig utility clearance)
287.7	16.2	10	15	18	SS-2	RESIDUAL SOIL: Silty SAND (SM), light gray (10YR 7/2), medium dense, moist, fine to coarse grained sand, angular quartz fragments, relict rock fabric
285.5	18.4	7	11	16	SS-3	13.6 ft: Pale yellow (2.5Y 7/4), dense
280.5	23.4	18	24	23	SS-4	16.2 ft: Medium dense 18.4 ft: Dense
275.6	28.3	16	25	37	SS-5	23.4 ft: Very dense
270.4	33.5	37	63/0.3		SS-6	276.4 / 27.5: WEATHERED ROCK: Severely weathered BIOTITE QUARTZ GNEISS (Sampled as Silty SAND (SM), brownish yellow (10YR 6/6), very dense, moist, fine to coarse grained sand, angular quartz rock fragments)
265.4	38.5	9	10	8	SS-7	272.9 / 31.0: RESIDUAL SOIL: Silty SAND (SM), light yellowish brown (10YR 6/4), medium dense, moist, fine grained sand, some mica, relict rock fabric
260.4	43.5	7	9	15	SS-8	38.5 ft: Wet
255.4	48.5	8	32	27	SS-9	43.5 ft: Very dense, fine to medium grained sand
250.4	53.5	50/0.2			SS-10	257.9 / 46.0: WEATHERED ROCK: Severely weathered BIOTITE QUARTZ GNEISS (Sampled as Silty SAND (SM), light yellowish brown (2.5Y 6/4), very dense, wet, fine to coarse grained sand, angular quartz rock fragments)
245.4	58.5	50/0.3			SS-11	
240.4	63.5	30	50/0.3		SS-12	
		50/0.3			SS-13	240.1 / 63.8: HARD ROCK: Gray to dark gray, with orange staining, moderately severely to moderately weathered, close fracturing, soft to medium hard, BIOTITE QUARTZ GNEISS
						234.6 / 69.3: WEATHERED ROCK: Brown, reddish brown, and dark gray, severely weathered, close fracturing, very soft to soft, BIOTITE QUARTZ GNEISS and BIOTITE GNEISS



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

MACTEC

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-21	DRILL METHOD: Mud Rotary/Rock Core	DRILL MACHINE: CME-55 Track (RAL)	0 HR. 10.5
GROUND ELEV.: 303.9 ft (NAVD88)	NORTHING: 3,909,811 US ft (NAD83)	EASTING: 11,686,270 US ft (NAD83)	24 HR. 29.5
TOTAL DEPTH: 151.8 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: 9/22/09	COMPLETED: 9/24/09	HOLE DIA.: 4"	CASING DEPTH: 63.8 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.	MOI	LOG	SOIL AND ROCK DESCRIPTION
229.1					Continued from previous page				
									227.1 — 76.8
									HARD ROCK: Black to light gray, with brown staining, moderately weathered, close fracturing, medium hard, BIOTITE GNEISS
									224.1 — 79.8
									223.1 — 80.8
									WEATHERED ROCK: Light gray, severely weathered, close fracturing, soft, BIOTITE QUARTZ GNEISS
									221.4 — 82.5
									HARD ROCK: Light gray, moderately weathered, close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS
									HARD ROCK: Dark and light gray to black, moderately severe to slightly weathered, close fracturing, soft to hard, BIOTITE GNEISS with hornblende
									212.1 — 91.8
									HARD ROCK: Gray to dark gray, slightly weathered to fresh, moderately close to wide fracturing, hard to very hard, BIOTITE GNEISS to QUARTZ BIOTITE GNEISS

MACTEC

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-21	DRILL METHOD: Mud Rotary/Rock Core	DRILL MACHINE: CME-55 Track (RAL)	0 HR. 10.5
GROUND ELEV.: 303.9 ft (NAVD88)	NORTHING: 3,909,811 US ft (NAD83)	EASTING: 11,686,270 US ft (NAD83)	24 HR. 29.5
TOTAL DEPTH: 151.8 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: 9/22/09	COMPLETED: 9/24/09	HOLE DIA.: 4"	CASING DEPTH: 63.8 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.	MOI	LOG	SOIL AND ROCK DESCRIPTION
154.3					Continued from previous page				
									152.1 151.8
									Boring and coring terminated at 151.8 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

MACTEC

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-21	DRILL METHOD: Mud Rotary/Rock Core	DRILL MACHINE: CME-55 Track (RAL)	0 HR. 10.5
GROUND ELEV.: 303.9 ft (NAVD88)	NORTHING: 3,909,811 US ft (NAD83)	EASTING: 11,686,270 US ft (NAD83)	24 HR. 29.5
TOTAL DEPTH: 151.8 ft	SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08		HAMMER (ID): 140-lb. Auto (MEC-21)
DATE STARTED: 9/22/09	COMPLETED: 9/24/09	CASING DEPTH: 63.8 ft	CORE BARREL TYPE: Wireline HQ3 Triple Tube, series 6 & 10 bits

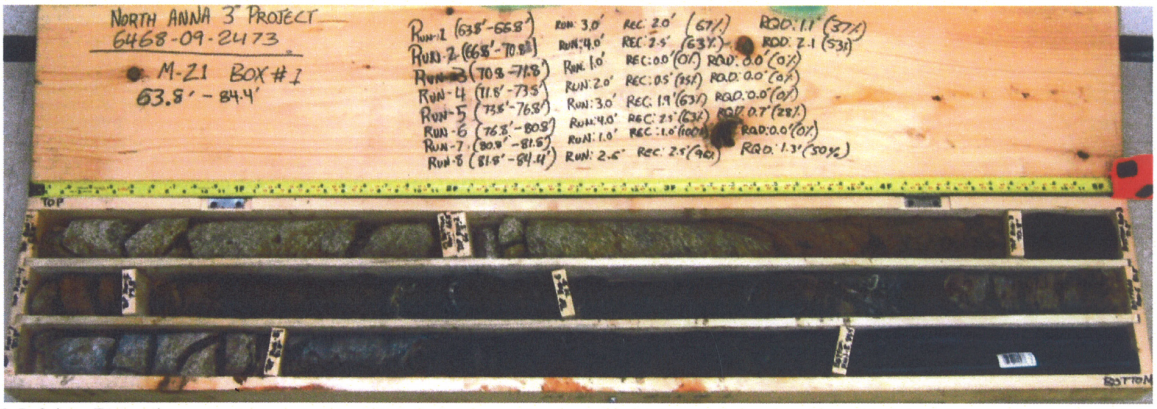
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 63.8 ft
240.1	63.8	3.0	5:34 3:21 2:49	(2.0) 67%	(1.1) 37%	RUN 1	(4.5) 82%	(3.2) 58%		240.1 HARD ROCK: Gray to dark gray, with orange staining, moderately severely to moderately weathered, close fracturing, soft to medium hard, BIOTITE QUARTZ GNEISS 63.8
237.1	66.8									(4 joints at 45°, tight; foliation at 45°)
		4.0	1:38 3:37 3:55 2:42	(2.5) 63%	(2.1) 53%	RUN 2				(2 joints at 65°, tight; foliation at 65°) 234.6
233.1	70.8						(2.4) 32%	(0.0) 0%		69.3 WEATHERED ROCK: Brown, reddish brown, and dark gray, severely weathered, close fracturing, very soft to soft, BIOTITE QUARTZ GNEISS and BIOTITE GNEISS
232.1	71.8	1.0	3:24	(0.0)	(0.0)	RUN 3				
230.1	73.8	2.0	2:28 2:41	0%	0%	RUN 4				
		5.0	2:27 2:33 2:11	(0.5) 25% (1.9) 38%	(0.0) 0% (0.0) 0%	RUN 5				(3 joints at 0-10°, tight with trace iron staining; 5 joints at 45°, tight with trace iron staining; foliation at 45°)
227.1	76.8									227.1 76.8
225.1	78.8	4.0	2:33 2:28 3:05 3:14	(2.5) 63%	(0.7) 18%	RUN 6	(1.7) 57%	(0.7) 23%		HARD ROCK: Black to light gray, with brown staining, moderately weathered, close fracturing, medium hard, BIOTITE GNEISS
223.1	80.8									224.1 (3 joints at 30°, tight; 1 joint at 80°, tight with quartz vein; foliation at 30°) 79.8
222.1	81.8	1.0	3:59	(1.0) 100%	(0.0) 0%	RUN 7	(0.8) 80%	(0.0) 0%		223.1 80.8 WEATHERED ROCK: Light gray, severely weathered, close fracturing, soft, BIOTITE QUARTZ GNEISS
219.5	84.4	2.6	5:15 2:27 2:45/0.6	(2.5) 96%	(1.3) 50%	RUN 8	(1.7) 100%	(0.7) 41%		221.4 82.5 HARD ROCK: Light gray, moderately weathered, close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS
217.1	86.8	2.4	0:36/0.4 5:14 6:58	(2.3) 96%	(1.5) 63%	RUN 9	(9.1) 98%	(4.9) 53%		(4 joints at 0-10°, tight; 2 joints at 45-55°, tight with trace iron staining)
		5.0	3:25 3:33 4:34 2:54	(5.0) 100%	(2.8) 56%	RUN 10				HARD ROCK: Dark and light gray to black, moderately severe to slightly weathered, close fracturing, soft to hard, BIOTITE GNEISS with hornblende (2 joints at 60°, tight; foliation at 60°) (5 joints at 0-10°, tight)
212.1	91.8		5:18							212.1 (5 joints at 50°, tight; foliation at 50°) 91.8
		5.0	5:53 3:23 3:42 3:37 3:11	(5.0) 100%	(3.1) 62%	RUN 11	(59.9) 100%	(57.3) 96%		HARD ROCK: Gray to dark gray, slightly weathered to fresh, moderately close to wide fracturing, hard to very hard, BIOTITE GNEISS to QUARTZ BIOTITE GNEISS (7 joints at 30-45°, tight with iron staining)
207.1	96.8									
		5.0	5:46 5:48 5:00 3:02 4:50	(5.0) 100%	(4.5) 90%	RUN 12				(4 joints at 50-60°, tight with trace chlorite; 2 quartz veins at 60° with trace calcite, chlorite, magnetite, and pyrite)
202.1	101.8									
		5.0	2:25 2:33 2:46 2:48 3:09	(5.0) 100%	(5.0) 100%	RUN 13				(3 joints at 45°, tight with trace hornblende and iron staining; foliation at 45°)
197.1	106.8									
		5.0	2:43 2:08 2:11 3:42 1:57	(5.0) 100%	(5.0) 100%	RUN 14				(2 joints at 40°, tight; 1 joint at 60°, tight)
192.1	111.8									
		5.0	2:38 2:17 2:02 2:08 2:12	(5.0) 100%	(5.0) 100%	RUN 15				(1 joint at 30°, tight)
187.1	116.8									
		5.0	3:49 2:42 2:12 2:30 2:42	(5.0) 100%	(4.8) 96%	RUN 16				(3 joints at 30°, tight; 1 quartz vein at 70° with trace pyrite)
182.1	121.8									
		5.0	2:27 2:33 2:35 2:42 2:48	(5.0) 100%	(5.0) 100%	RUN 17				(2 joints at 25°, tight; 1 joint at 45°, tight; trace pyrite)
177.1	126.8									
		5.0	2:40 2:38 2:48 2:55 2:59	(4.9) 98%	(4.9) 98%	RUN 18				(3 joints at 50°, tight; foliation at 50°)
172.1	131.8									
		5.0	2:10 2:09 2:02 1:53 1:48	(5.0) 100%	(5.0) 100%	RUN 19				(1 joint at 45°, tight)
167.1	136.8									
		5.0	2:51 2:25	(5.0)	(5.0)	RUN 20				(No joints)

MACTEC

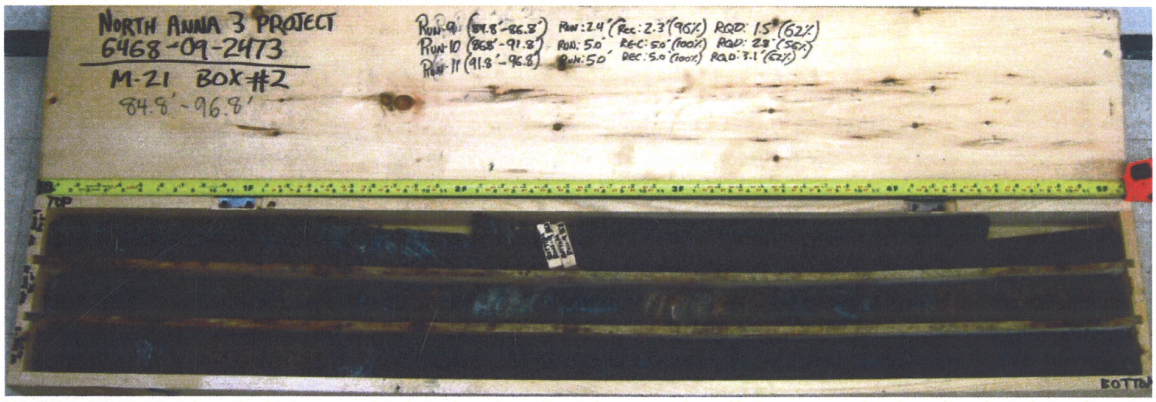
BECHTEL PROJECT NO.: 25161	MACTEC PROJECT NO.: 6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST: R. Clark
SITE DESCRIPTION: North Anna 3 Project Supplement 2		DRILLER: F. Cox/R. Hall	FLUID LEVEL (ft)
BORING NO.: M-21	DRILL METHOD: Mud Rotary/Rock Core	DRILL MACHINE: CME-55 Track (RAL)	0 HR. 10.5
GROUND ELEV.: 303.9 ft (NAVD88)	NORTHING: 3,909,811 US ft (NAD83)	EASTING: 11,686,270 US ft (NAD83)	24 HR. 29.5
TOTAL DEPTH: 151.8 ft	SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08		HAMMER (ID): 140-lb. Auto (MEC-21)
DATE STARTED: 9/22/09	COMPLETED: 9/24/09	CASING DEPTH: 63.8 ft	CORE BARREL TYPE: Wireline HQ3 Triple Tube, series 6 & 10 bits

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
162.1	141.8		2:31 1:54 1:48	100%	100%					HARD ROCK: Gray to dark gray, slightly weathered to fresh, moderately close to wide fracturing, hard to very hard, BIOTITE GNEISS to QUARTZ BIOTITE GNEISS *(continued)* (1 joint at 55°, tight; foliation at 55°; trace pyrite)
157.1	146.8	5.0	2:03 2:26 2:06 2:46 2:05	(5.0) 100%	(5.0) 100%	RUN 21				
152.1	151.8	5.0	2:08 2:33 2:25 2:11 2:04	(5.0) 100%	(5.0) 100%	RUN 22				(No joints; trace pyrite and hornblende) 152.1 151.8
										Boring and coring terminated at 151.8 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-21 – Box 1



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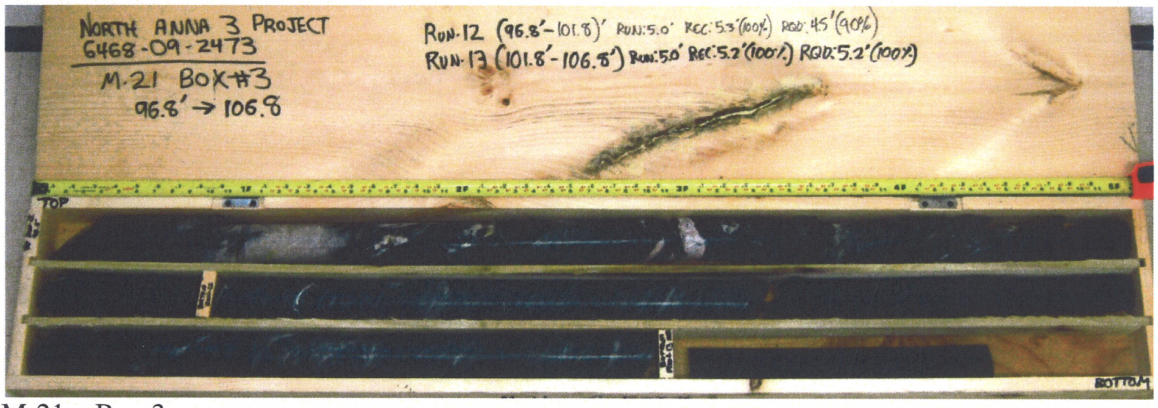

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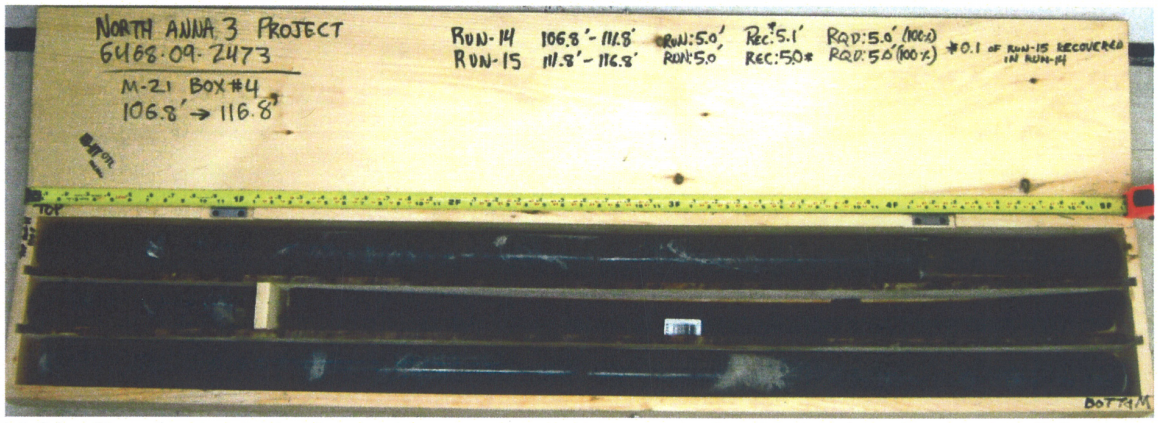

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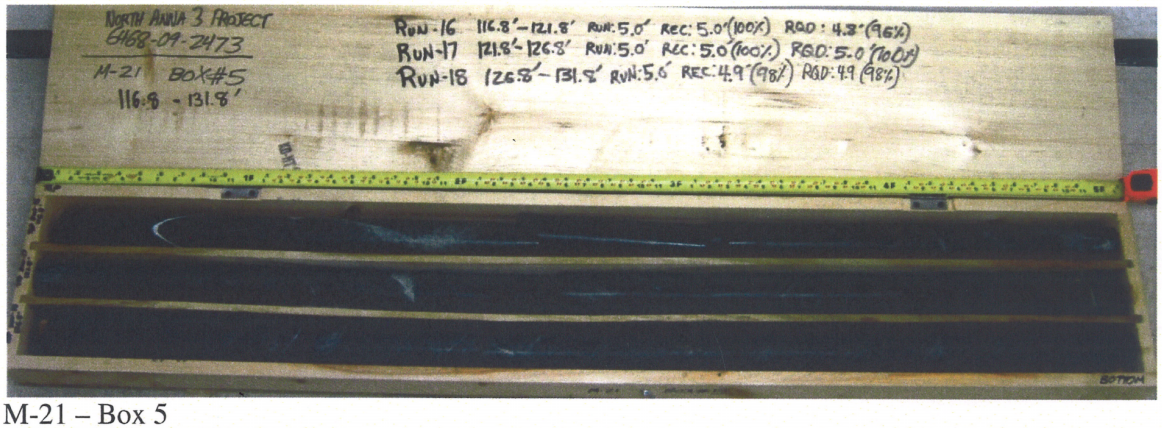

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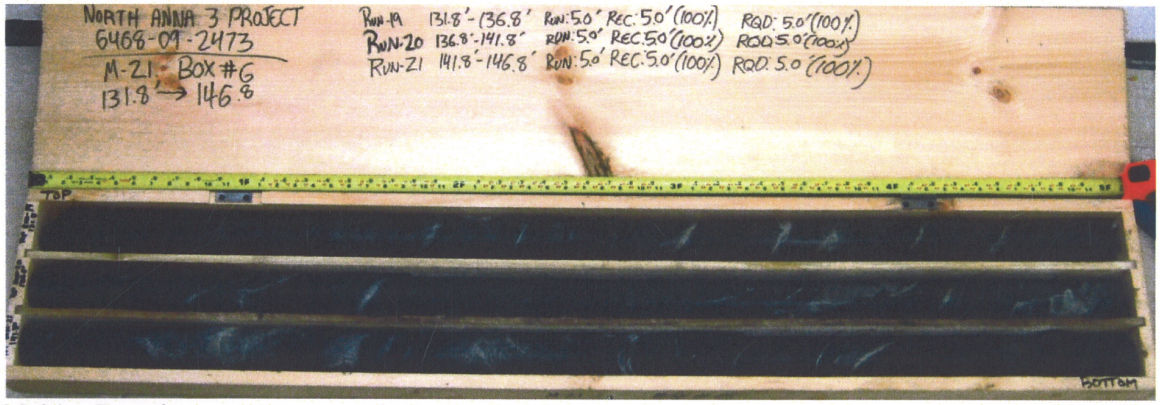

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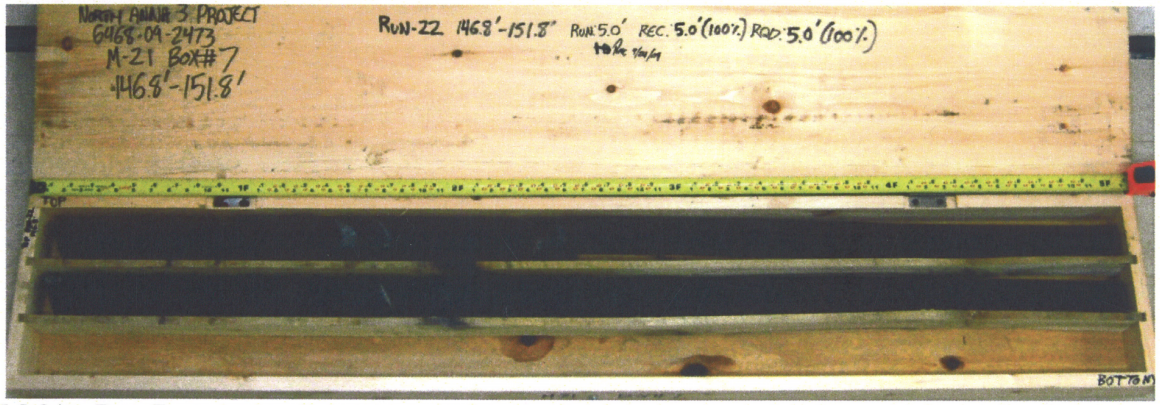


M-21 – Box 7

MACTEC

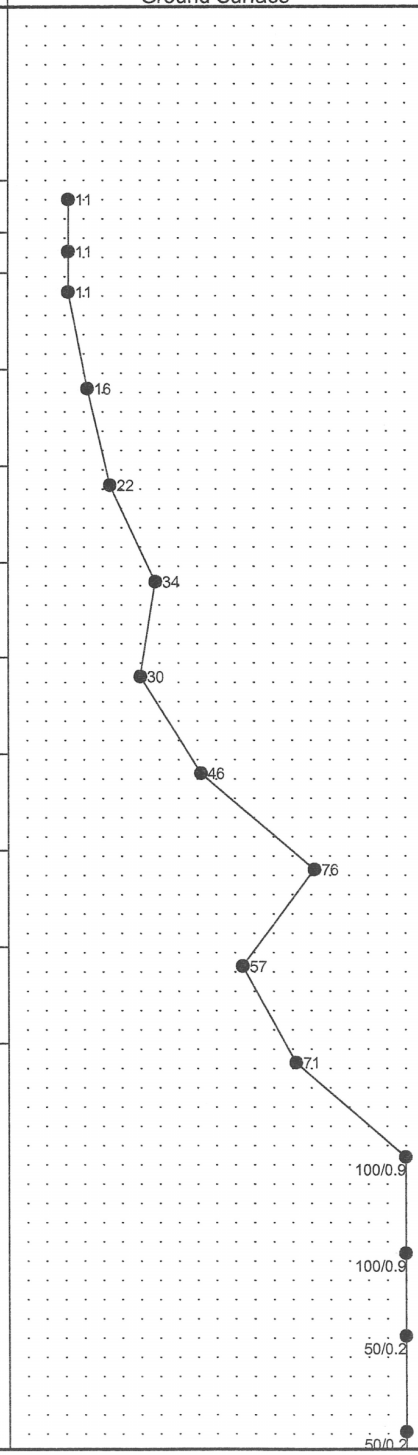
GEOTECHNICAL BORING LOG

Prepared By JSJ Date 12/16/09
Checked By MGL Date 12/16/09

BECHTEL PROJECT NO.: 25161	MACTEC PROJECT NO.: 6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST: C. Baldwin
SITE DESCRIPTION: North Anna 3 Project Supplement 2		DRILLER: P. Pitts/J. Tucker	FLUID LEVEL (ft)
BORING NO.: M-27	DRILL METHOD: Mud Rotary/Rock Core	DRILL MACHINE: CME-55 Trailer (RAL)	0 HR. NA
GROUND ELEV.: 330.2 ft (NAVD88)	NORTHING: 3,909,426 US ft (NAD83)	EASTING: 11,685,938 US ft (NAD83)	24 HR. 34.0
TOTAL DEPTH: 151.4 ft	SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08	ROD TYPE: AWJ	HAMMER (ID):140-lb. Auto (MEC-425)
DATE STARTED: 9/15/09	COMPLETED: 9/21/09	HOLE DIA.: 3"	CASING DEPTH: 114.6 ft
CORE SIZE: NQ3	BITS USED: 2-7/8" Tri-Cone		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	SAMP. NO.	SOIL AND ROCK DESCRIPTION
330.2						Ground Surface
330.2	0.0					No sampling from 0.0 to 9.0 feet due to soft dig utility clearance by Dominion Personnel
321.2	9.0					
318.5	11.7	5	4	7	SS-1	RESIDUAL SOIL: Silty SAND (SM), reddish yellow (7.5YR 6/6), medium dense, moist, fine to coarse grained sand, little mica, relict rock fabric
316.4	13.8	5	5	6	SS-2	11.7 ft: Very pale brown (10YR 7/3), fine to medium grained sand
311.4	18.8	5	4	7	SS-3	
306.4	23.8	7	8	8	SS-4	18.8 ft: Light yellowish brown (10YR 6/4), fine to coarse grained sand
301.4	28.8	8	11	11	SS-5	23.8 ft: Very pale brown (10YR 7/3)
296.5	33.7	10	15	19	SS-6	28.8 ft: Pale brown (10YR 6/3), dense, fine to medium grained sand
291.5	38.7	12	15	15	SS-7	33.7 ft: Brownish yellow (10YR 6/6), medium dense, fine to coarse grained sand
286.5	43.7	19	21	25	SS-8	38.7 ft: Dense
281.5	48.7	22	41	35	SS-9	43.7 ft: Very pale brown (10YR 7/3), very dense
276.5	53.7	16	26	31	SS-10	48.7 ft: Light yellowish brown (10YR 6/4)
271.5	58.7	17	21	50	SS-11	
273.2	57.0					WEATHERED ROCK: Severely weathered BIOTITE QUARTZ GNEISS (Sampled as Silty SAND (SM), light yellowish brown (10YR 6/4), very dense, moist, fine to coarse grained sand, little mica)
266.5	63.7	42	58/0.4		SS-12	
261.5	68.7	37	63/0.4		SS-13	63.7 ft: Yellowish brown (10YR 5/6)
256.5	73.7	50/0.2			SS-14	
		50/0.2			SS-15	

BLOWS PER FOOT (0, 20, 40, 60, 80, 100)



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MACTEC

BECHTEL PROJECT NO.: 25161	MACTEC PROJECT NO.: 6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST: C. Baldwin
SITE DESCRIPTION: North Anna 3 Project Supplement 2		DRILLER: P. Pitts/J. Tucker	FLUID LEVEL (ft)
BORING NO.: M-27	DRILL METHOD: Mud Rotary/Rock Core	DRILL MACHINE: CME-55 Trailer (RAL)	0 HR. NA
GROUND ELEV.: 330.2 ft (NAVD88)	NORTHING: 3,909,426 US ft (NAD83)	EASTING: 11,685,938 US ft (NAD83)	24 HR. 34.0
TOTAL DEPTH: 151.4 ft	SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08	ROD TYPE: AWJ	HAMMER (ID):140-lb. Auto (MEC-425)
DATE STARTED: 9/15/09	COMPLETED: 9/21/09	HOLE DIA.: 3"	CASING DEPTH: 114.6 ft
CORE SIZE: NQ3	BITS USED: 2-7/8" 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.	MOI	LOG	SOIL AND ROCK DESCRIPTION
255.4					Continued from previous page				
251.5	78.7	50/0.1			50/0.1	SS-16			WEATHERED ROCK: Severely weathered BIOTITE QUARTZ GNEISS (Sampled as Silty SAND (SM), light yellowish brown (10YR 6/4), very dense, moist, fine to coarse grained sand, little mica) *(continued)*
243.8	86.4	50/0.2			50/0.2	SS-17			86.4 ft: Pale Yellow (2.5YR 7/3)
239.4	90.8	50/0.3			50/0.3	SS-18			
234.4	95.8	50/0.2			50/0.2	SS-19			95.8 ft: Very pale brown (10YR 7/4)
229.4	100.8	41	59/0.5		100/1.0	SS-20			
224.4	105.8	50/0.1			50/0.1	SS-21			
219.4	110.8	50/0.1			50/0.1	SS-22			
214.4	115.8	100/0.0			100/0.0	SS-23			115.0 ft: Hard Drilling/Bit Chatter; SPT Refusal with no penetration at 115.8 ft
215.2	115.0								HARD ROCK: Gray and white to light gray, with orange staining, moderately severely to moderately weathered, very close to close fracturing, medium hard to moderately hard, BIOTITE QUARTZ GNEISS
208.8	121.4								HARD ROCK: Gray and white with trace orange staining, moderately to slightly weathered, very close to moderately close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS
193.8	136.4								HARD ROCK: Gray and white with trace orange staining, moderately to very slightly weathered, close to moderately close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS

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

MACTEC

BECHTEL PROJECT NO.: 25161	MACTEC PROJECT NO.: 6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST: C. Baldwin
SITE DESCRIPTION: North Anna 3 Project Supplement 2		DRILLER: P. Pitts/J. Tucker	FLUID LEVEL (ft)
BORING NO.: M-27	DRILL METHOD: Mud Rotary/Rock Core	DRILL MACHINE: CME-55 Trailer (RAL)	0 HR. NA
GROUND ELEV.: 330.2 ft (NAVD88)	NORTHING: 3,909,426 US ft (NAD83)	EASTING: 11,685,938 US ft (NAD83)	24 HR. 34.0
TOTAL DEPTH: 151.4 ft	SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08	ROD TYPE: AWJ	HAMMER (ID):140-lb. Auto (MEC-425)
DATE STARTED: 9/15/09	COMPLETED: 9/21/09	HOLE DIA.: 3"	CASING DEPTH: 114.6 ft
CORE SIZE: NQ3	BITS USED: 2-7/8" 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.	MOI	LOG	SOIL AND ROCK DESCRIPTION
180.6					Continued from previous page				
									178.8 151.4

Boring and coring terminated at 151.4 feet.

Boring closed by tremie method with cement-bentonite grout.

24 hour water level measured on 9/21/2009 prior to drilling. Borehole was at a depth of 146.4 feet.

MACTEC

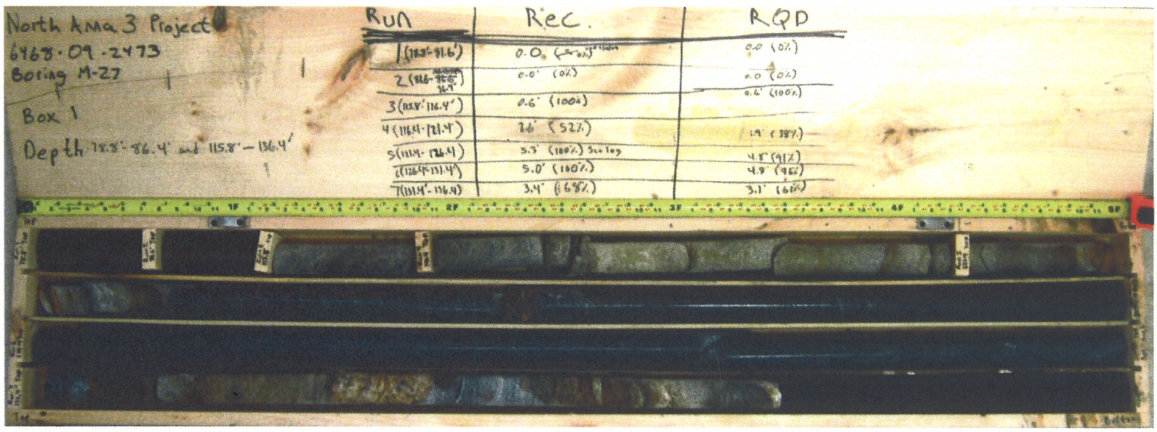
SHEET 1 OF 1

BECHTEL PROJECT NO.: 25161	MACTEC PROJECT NO.: 6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST: C. Baldwin
SITE DESCRIPTION: North Anna 3 Project Supplement 2		DRILLER: P. Pitts/J. Tucker	FLUID LEVEL (ft)
BORING NO.: M-27	DRILL METHOD: Mud Rotary/Rock Core	DRILL MACHINE: CME-55 Trailer (RAL)	0 HR. NA
GROUND ELEV.: 330.2 ft (NAVD88)	NORTHING: 3,909,426 US ft (NAD83)	EASTING: 11,685,938 US ft (NAD83)	24 HR. 34.0
TOTAL DEPTH: 151.4 ft	SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08		HAMMER (ID): 140-lb. Auto (MEC-425)
DATE STARTED: 9/15/09	COMPLETED: 9/21/09	CASING DEPTH: 114.6 ft	CORE BARREL TYPE: Wireline NQ3 Triple Tube, series 6 bit

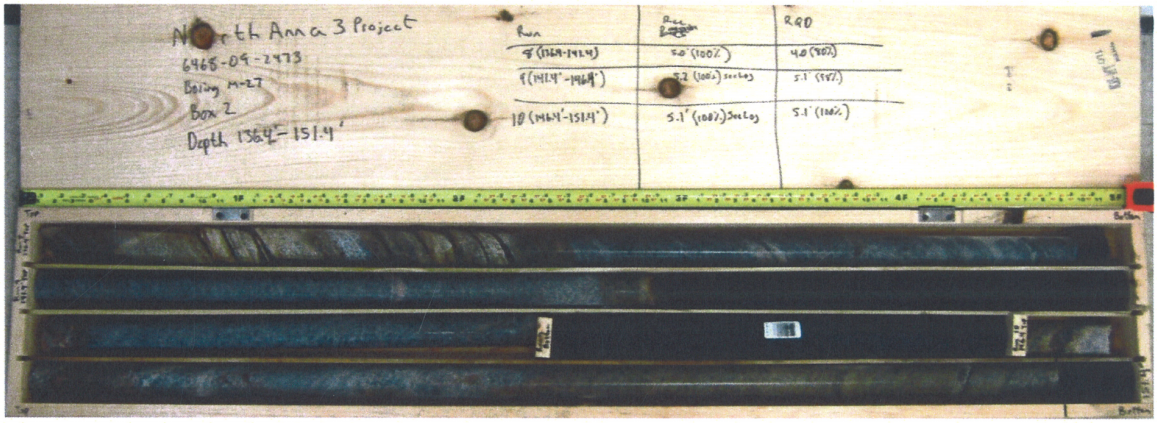
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 78.8 ft
251.4	78.8	2.8	3:57	(0.0)	(0.0)	RUN 1	(0.0)	(0.0)		WEATHERED ROCK: Severely weathered BIOTITE QUARTZ GNEISS
			3:08	0%	0%		0%	0%		(Sampled as Silty SAND (SM), light yellowish brown (10YR 6/4), very dense,
248.6	81.6		2:03/0.8							moist, fine to coarse grained sand, little mica) *(continued)*
		4.8	4:40	(0.0)	(0.0)	RUN 2				(No Recovery)
			4:10	0%	0%					(No Recovery)
			2:42							
			2:30							
243.8	86.4		2:46/0.8							
			N=50/0.2			*SS-17*				86.4 ft: Pale Yellow (2.5YR 7/3)
			N=50/0.3			*SS-18*				
			N=50/0.2			*SS-19*				95.8 ft: Very pale brown (10YR 7/4)
			N=100/1.0			*SS-20*				
			N=50/0.1			*SS-21*				
			N=50/0.1			*SS-22*				
										115.0 ft: Hard Drilling/Bit Chatter; SPT Refusal with no penetration at 115.8 ft
										215.2 — 115.0
214.4	115.8	0.6	*N=100/0.0*	(0.6)	(0.6)	RUN 3	(3.5)	(2.5)		HARD ROCK: Gray and white to light gray, with orange staining, moderately
213.8	116.4	5.0	1:40/0.6	100%	100%	RUN 4	63%	45%		severely to moderately weathered, very close to close fracturing, medium hard
			2:38	(2.9)	(1.9)					to moderately hard, BIOTITE QUARTZ GNEISS
			1:26	58%	38%					(5 joints at 0°, tight; 3 joints at 30°, tight)
			3:47							
			1:20							
208.8	121.4		2:26							208.8 — 121.4
		5.0	3:20	(5.0)	(4.8)	RUN 5	(13.4)	(12.7)		HARD ROCK: Gray and white with trace orange staining, moderately to slightly
			4:54	100%	96%		89%	85%		weathered, very close to moderately close fracturing, moderately hard to hard,
			1:25							BIOTITE QUARTZ GNEISS
			2:13							(1 joint at 30°, tight; 3 joints at 50°, tight)
203.8	126.4		3:30							
		5.0	3:05	(5.0)	(4.8)	RUN 6				(1 joint at 20°, tight; 1 joint at 60°, tight)
			3:24	100%	96%					
			3:14							
			2:36							
198.8	131.4		2:35							
		5.0	2:41	(3.4)	(3.1)	RUN 7				(2 joints at 0°, tight to open; 2 joints at 10-20°, tight)
			3:50	68%	62%					
			2:00							
			2:20							
193.8	136.4		2:18							193.8 — 136.4
		5.0	2:44	(5.0)	(4.0)	RUN 8	(15.0)	(14.0)		HARD ROCK: Gray and white with trace orange staining, moderately to very
			2:34	100%	80%		100%	93%		slightly weathered, close to moderately close fracturing, moderately hard to
			3:15							hard, BIOTITE QUARTZ GNEISS
			3:19							(9 joints at 40°, tight; 1 joint at 60°, tight)
188.8	141.4		3:55							
		5.0	4:27	(5.0)	(5.0)	RUN 9				(1 joint at 20°, open)
			4:45	100%	100%					
			2:08							
			4:00							
183.8	146.4		3:00							
		5.0	3:35	(5.0)	(5.0)	RUN 10				(2 joints at 20-30°, tight)
			4:18	100%	100%					
			4:45							
			6:20							
178.8	151.4		5:50							178.8 — 151.4
										Boring and coring terminated at 151.4 feet.
										Boring closed by tremie method with cement-bentonite grout.

24 hour water level measured on 9/21/2009 prior to drilling. Borehole was at a depth of 146.4 feet.

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



M-27 – Box 1



M-27 – Box 2