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 MACTEC Engineering and Consulting
 MACTEC Development

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TO:	CHRIS HENSLEY	DATE:	5/3/05
FIRM:	TVA	SUBJECT:	DRILLING PROGRESS @ TVA KINISTON SYSTEM SITE.
FAX:	423-757-7094		
TEL:			
# PAGES:	7 + this cover sheet		
COPY TO:			
FROM:	MACTEC	COMMENTS:	FIELD BORINGS FOR NB-63 and NB-66.
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MACTEC SOIL TEST BORING FIELD REPORT

BORING NO. NB-63 PG. 1
RIG TYPE CME75 HAMMER TYPE 136

JOB NO. 3043051021 DRILLER J. W. R. R. R. HOURS DRILLING _____ GROUND SURFACE LEV
JOB NAME TVA Kingston LOGGED BY T. J. J. HOURS MOVING _____ DATE: 4/20 WEATHER: RAIN

SAMPLING				SCALES		SOIL DESCRIPTION		REMARKS	
No	Depth	1st	2nd	3rd	4th	1st	2nd	3rd	4th
1	0-1.5	4	6	12		1.1	Topsoil - 0 to 0.2 FT		Note: OFFSET NO. 102
							From 2 to 3.0 FT - VERY STIFF		Approx. 39 FT S.P.S.E
							Brown Dry Silty clay with a few chert fragments and black manganese nodules - fill		(No chert in clay)
2	1.5-3.0	6	11	11		1.2			
3	3-4.5	4	5	5		1.3	From 3.0 to 10.0' Firm to stiff Reddish Orange Slightly moist to moist clay (FRT) with a few chert fragments - Random		
4	4.5-6.0	3	3	4		1.4			
5	6-8.5	2	4	6		1.5	From 10' to 22' - Soft to Firm Reddish Orange Yellowed brown and gray moist clay (FRT) with a few chert fragments - Random		
6	8.5-10	3	5	6		1.5			
7	10-11.5	2	3	3		1.5			Note: Yellowish and gray moist appear moist in orientation Possible head joints
8	11.5-13	2	3	3		1.5			
9	13-14.5	1	3	3		1.5			
10	14.5-16	1	3	3		1.5			
11	16-18.5	1	2	3		1.5			
12	17.5-19	2	2	2		1.5			Note: Not same as from 18.5 to 20' (Sandstone)
13	19-20.5	2	2	3		1.5			
14	20.5-22	2	3	3		1.5			

BORING TERMINATED: 43.2 FT (75.1 FT)
 BORING REFUSAL: 43.2 FT
 WATER TOB DEPTH: 42.5 FT (at time of drilling)
 WATER 24 HR.: DEPTH 16.8 FT
 WATER LOSSES _____
 CAVE-IN DEPTHS _____
 CASING: SIZE _____ LENGTH _____
 STANDBY TIME _____ BORING LAYOUT _____

METHOD OF ADVANCING BORING
 POWER AUGER 3 1/4"
 HAND SHOP: WMUD: WWATER
 ROTARY DRILL: WMUD: WWATER
 DIAMOND CORE
 CORE SIZE NW
 UNDISTURBED SAMPLES NO. _____ SIZE _____
 BAG SAMPLES NO. _____

STANDARD PENETRATION TESTS ARE IN SUNDRIES FOR NOT AND NOT TO DRIVE 136 IN 2-30
 RIG TYPE CME75 WITH 136 FOR SOIL TESTING

MACTEC SOIL TEST BORING FIELD REPORT

BORING NO. NB-63 PG. 2 OF 3
RIG TYPE CME 75 HAMMER TYPE Auto

NO. 3043051021

DRILLER V. Warren

HOURS DRILLING _____

GROUND SURFACE ELEV. _____

JOB NAME TVA Kingston

LOGGED BY T. Jantzen

HOURS MOVING _____

DATE 4/29 WEATHER Fair

No. Depth	SPR. BLKS	W	BLKS	W	BLKS	DESCRIPTION
15 22-23.5	2	5	4	1.5		From 22 to 29.5' - Firm to stiff reddish orange slightly moist clay (fat) with some chert fragments - Residue
16 23.5-25	1	4	5	1.5		fragments - Residue
17 25-26.5	3	5	6	1.5		
18 26.5-28	1	2	4	1.5		
19 28-29.5	3	4	7	1.5		
20 29.5-31	7	9	9	1.5		From 29.5' to 32.5' - Very stiff reddish orange slightly moist clay (fat) with mostly chert fragments - Residue
21 31-32.5	5	12	8	1.5		fragments - Residue
22 32.5-34	4	6	6	1.5		From 32.5' to 34' - Stiff reddish orange sl. moist clay (fat) with a few chert fragments - Residue
23 34-35.5	12	16	8	1.5		From 34' to 38.5' - Stiff to very stiff reddish orange moist clay (fat) with mostly chert fragments - Residue
24 35.5-37	8	12	6	1.5		(Note: Chert content = 50%)
25 37-38.5	4	4	6	0.5		From 38.5' to 42.5' - Stiff dark yellowish brown slightly moist to moist clay (fat) with a few chert fragments - Residue
26 38.5-40	2	5	6	1.5		very - chert fragments - Residue
27 40-41.5	2	4	5	0.3		From 42.5' to 43.2' - Very hard gray wet Dolomite fragments - Residue
28 41.5-43	3	25	10	1.0		X - 42.5 FT

Note: From 22 to 29.5' Chert content gradually increases

Note: Chert content = 50%

(Note: Chert content = 50%)

STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-38 1/2" SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES.

BORING TERMINATED: 43.2 FT
 BORING REFUSAL: 43.2 FT
 WATER TOB DEPTH: 42.5 FT (12 min of drilling)
 WATER 24 HR.: DEPTH: 16.6 FT
 WATER LOSSES: _____
 CAVE-IN DEPTHS: _____
 CASING: SIZE _____ LENGTH _____
 STANDBY TIME _____ BORING LAYOUT _____

METHOD OF ADVANCING BORING
 POWER AUGER 3/4"
 HAND SHOP: WMUD: WWATER
 ROTARY DRILL: WMUD: WWATER
 DIAMOND CORE
 CORE SIZE NQ
 UNDISTURBED SAMPLES NO _____ SIZE _____
 BAG SAMPLES NO _____

DEPTH
 0 TO 43.2 FT
 TO _____
 TO _____
 TO _____
 45.1 TO 75.1'

MACTEC SOIL TEST BORING FIELD REPORT

BORING NO. NB-63 PG. 3 OF 3

RIG TYPE CME 75 HAMMER TYPE Auto

JOB NO. 304305102 DRILLER J. WARREN HOURS DRILLING _____ GROUND SURFACE ELEV. _____

JOB NAME TVA Kingsport LOGGED BY T. Justice HOURS MOVING _____ DATE 4/27/02 WEATHER: Rain

DEPTH	SOIL DESCRIPTION	REMARKS
0 - 43.2	Auger Refusal @ 43.2 FT	
BEGAN NO CORING @ 45.1 FT		
Run # 1; 45.1 FT TO 54.9 FT		
RAN = 8.9 FT		
REG = 8.0 FT (90%)		
ROD = 7.5/8.9 = (84%)		
Run # 2; 54.9 FT TO 64.9 FT		
RAN = 10.0 FT		
REG = 9.7 FT (97%)		
ROD = 6.8/10.0 = (68%)		
Run # 3; 64.9 FT TO 75.1 FT		
RAN = 10.2 FT		
REG = 9.7 FT (95%)		
ROD = 7.2/10.2 = (71%)		
CORING TERMINATED @ 75.1 FT		

Very slightly weathered, closely jointed,
 BEDDING NOT EVIDENT, LIGHT GRAY,
 FINE GRAINED, VERY STRONG DOWNSIDE
 SEVERAL JOINT SETS OBSERVED Most Notable
 ORIENTED @ 60 to 90° and 45°

STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 6" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES.

BORING TERMINATED: 43.2 FT 75.1 FT
 BORING REFUSAL: 43.2 FT
 WATER TOB DEPTH 42.5 FT (at time of drilling)
 WATER 24 HR. DEPTH 16.6 FT
 WATER LOSSES _____
 CAVE-IN DEPTHS _____
 CASING: SIZE _____ LENGTH _____
 STANDBY TIME _____ BORING LAYOUT _____

METHOD OF ADVANCING BORING
 POWER AUGER 3 1/4"
 HAND SHOP: W/MUD: W/WATER
 ROTARY DRILL: W/MUD: W/WATER
 DIAMOND CORE YES
 CORE SIZE ✓
 UNDISTURBED SAMPLES NO _____ SIZE _____
 BAG SAMPLES NO _____

DEPTH
 0 TO 43.2 FT
 _____ TO _____
 _____ TO _____
 _____ TO _____
43.1 TO 75.1



SOIL TEST BORING FIELD REPORT

JOB NO. 3043851021
 JOB NAME TUA KINSELOW

DRILLER M. Burnett
 LOGGED BY J. Mason

BORING NO. NB-66
 HOURS DRILLING _____ GROUND SURFACE ELEV. _____
 HOURS MOVING _____ DATE: 5/2/05

No.	Depth	SAMPLING			SCALE	UD	REC	SOIL CLASSIFICATION
		1st	2nd	3rd				
1	09:51	3	3	3			1.4 Fine, 2.5% clay brown, clayey SILT (top soil), slightly moist. Residuum.	
					UD	6	2.0' As below from 6.0 - 7.5 ft.	
2	10:12	4	5	6			0.6 STIFF, 5% clay yellowish red, very silty CLAY, slightly moist. Residuum.	
					UD	2	1.7' As below from 9.5 - 11.0 ft.	
3	10:29	2	5	5			1.5 STIFF, 5% clay yellowish red, very silty CLAY, with occasional lumpy black manganese nodules throughout. Slightly moist.	
					UD	3	2.0	
4	10:45	5	8	13			1.5 Very stiff, mottled (5% 5/8 yellowish red and 10% 6/8 brownish yellow) silty CLAY, slightly moist. Note: small saturated zone somewhere above. 12' as outside of split spoon is wet.	
					UD	4	2.0 As below from 19 - 20.5 ft.	
5	11:35	4	6	6			1.5 STIFF, mottled (5% 5/8 yellowish red, 10% 6/8 brownish yellow, & 10% 2/8 black brown manganese staining), very slightly sandy (fine, micaceous) silty CLAY, slightly moist. Residuum.	
					UD	5	2.0' As above from 19.0' - 20.5'	

BORING TERMINATED: 06.40'
 BORING REFUSAL: 30.4'
 WATER TOB DEPTH @ 1st start drilling = 16.5 FT
 WATER 24 HR.: DEPTH _____
 WATER LOSSES _____
 CAVE-IN DEPTHS _____
 CASING: SIZE _____ LENGTH _____
 STANDARD TIME _____ BORING LAYOUT _____
 MAY-04-2005 07:36 8655888026

METHOD OF ADVANCING BORING
 POWER AUGER 3 1/4"
 HAND SHOP: WMUD: WWATER _____
 ROTARY DRILL: WMUD: WWATER _____
 DIAMOND CORE _____
 CORE SIZE NO. _____
 UNDISTURBED SAMPLES NO. 6 SIZE _____
 BAG SAMPLES (Secor make) NO. _____
 96%

DEPTH:
 TO _____
 TO _____
 TO _____
 TO _____
 TO _____

STANDARD PENETRATION RESISTANCE IS NOT TO BE USED FOR 2" AND 3" DIAMETERS TO DRIVE 1" OR 2" DIA. SPT SPT SAMPLES WITH STANDARD PENETRATION RESISTANCE



SOIL TEST BORING FIELD REPORT

JOB NO. 3043051021 DRILLER M. Burnett BORING NO. NIB-66--
 JOB NAME TVA KANESETON LOGGED BY I. Mason HOURS DRILLING GROUND SURFACE ELE
 HOURS MOVING DATE: 5/2/05 WEATHER:

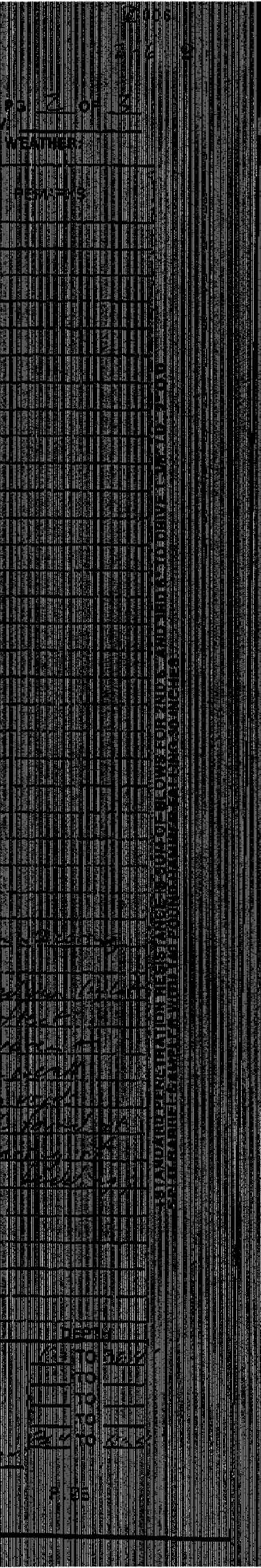
No. Depth	SAMPLING			SCALE	UN	REV	SOIL CLASSIFICATION
	1" N	2" N	3" N				
6 24/25.5 11:54	3	3	4	0			1.5' Firm, 10% 5/8 yellowish brown slightly sandy to sandy, silty CLAY, slightly moist. Residuum.
				5	UB 27-29 6		1.9'
7 29/30.5 12:15	2	6	8	0			1.5' Stiff mottled (10% 4/4 dark yellowish brown, 10% 2/1 black, 10% 7/6 yellow) silty clay, with increasing sand content with depth, as well as 5mm to 2cm rounded chert and severely weathered, rounded sandstone gravel. Has the appearance of claystone , possible colluvium.
				5	UB 32-34 7		0.4' Tube crushed; loose clay with some chert gravel in tube.
8 34/35.5 14:26	6	17	7	0			0.45' Very stiff, 7.5% 4/4 brown, slightly sandy, silty CLAY, with abundant 1 to 2.5 cm, angular, slightly weathered chert fragments. Moist. Residuum.

Augers refused @ approximately 37'. Set NW casing to 38.52 ft, began casing @ 36.38 ft.
 36.38 to 54.8 ft.: Dolomite, 5% 6/1 light brownish gray to NG medium gray. Fine grained. May be slightly siliceous; bright light may reflect silica. Recovered core is indurated. Bedding is likely at an angle of 40° to 50°, but is largely indistinct. Recovered core pieces are slightly to moderately weathered; locally, weathering has resulted in fractured material. Recovered core is hard. A pervasive joint set with an average spacing of about 60", with an average spacing of about 3.5 cm. Joint set appears to be orthogonal with many joint surfaces showing thin white coating of dolomite.

38.8 ft. to 47.84 ft. (closed) of
 47.84 to 48.3 ft. (open) of

BORING TERMINATED: 66.40 FT
 BORING REFUSAL: 36.4 FT
 WATER TOB DEPTH (at time of drilling) = 16.5 FT
 WATER 24 HR.: DEPTH _____
 WATER LOSSES _____
 CAVE-IN DEPTHS _____
 CASING: SIZE _____ LENGTH _____
 MAY-04-2005 07:37 8655886026

METHOD OF ADVANCING BORING
 POWER AUGER 3 1/4"
 HAND SHOP: W/MUD: W/WATER
 ROTARY DRILL: W/MUD: W/WATER
 DIAMOND CORE
 CORE SIZE NIB
 UNDISTURBED SAMPLES, NO 6 SIZE 3
 96%





SOIL TEST BORING FIELD REPORT

JOB NO. 3043051021 DRILLER M. Burnett BORING NO. NB-66 PG. 3 OF 3
 JOB NAME TVA KINGSTON LOGGED BY J. Mason HOURS DRILLING _____ GROUND SURFACE ELEV. _____
 HOURS MOVING _____ DATE: 5-3-05 WEATHER: _____

No. Depth	SAMPLING			UD	REC	SOIL CLASSIFICATION	REMARKS
	1" 6"	2" 6"	3" 6"				
54.8 to 63.65 ft.	Dolomite. Mottled (5YR 6/1 light brownish gray and 5YR 4/1 brownish gray). Fine grained, with some ^{an} often "crystalline" appearance. Recovered core is indurated, thickly bedded without distinct, noticeable bedding surfaces; bedding is likely at 40° to 50° apparent dip. Recovered core is slightly weathered, but may locally be completely weathered, resulting in void (noted below). Recovered core is hard. The dolomite is jointed with 55°-apparent dip joints at an average spacing of about 6".						
57.5 to 63.65 ft.	Void (open) pit						
63.65 to 64.4 ft.	Dolomite. 5YR 7/2 grayish orange pink to 5YR 6/1 light brownish gray; color often takes on sun-wide bands. Fine-grained slightly weathered, very hard.						
64.4 to 66.4 ft.	Dolomite. N7 light gray to N6 medium light gray. Fine-grained, indurated. Bedding at an apparent dip of 40° to 50°, and is marked by thin (laminar), discontinuous dark layers that have a slightly stylolitic appearance; thinly bedded. Slightly weathered, hard.						
<ul style="list-style-type: none"> • Run 1 from 36.38 to 38.22 ft.; ran 1.84 ft., recovered 1.03 ft. (56%). RRD = 0. Run time: 17:00 - 17:09. 100% DW loss. • Run 2 from 38.22 to 46.04 ft.; ran 7.82 ft., recovered 0.6 ft. (8%). RRD = 0. Run time: 18:00 - 18:05. 100% DW loss. • Run 3 from 46.04 to 53.29 ft.; ran 7.25 ft., recovered 4.1 ft. (57%). RRD = 0. Run time: 18:39 - 18:44; 18:55 - 19:01, 19:26 - 19:43. 100% DW loss. • Run 4 from 53.29 to 63.29 ft.; ran 10.0 ft., recovered 4.13 ft. (41%). RRD = 2/10 = 20%. Run time: 11:38 - 11:45, 12:30 - 12:37, 12:46 - 12:49. 100% DW loss. • Run 5 from 63.29 to 66.40 ft.; ran 3.11 ft., recovered 1.95 ft. (63%). RRD = 1.45/3.11 = 47%. Run time: 13:00 - 13:15, 13:20 - 13:25. 100% DW loss. 							

*STANDARD PENETRATION RESISTANCE IS SUM OF BLOWS FOR 2ND 9" AND 3RD 6" TO DRIVE 1-3/8" I.D., 2" O.D. SPLIT BARREL SAMPLER WITH 140 POUND HAMMER FALLING 30 INCHES.

BORING TERMINATED: 66.40
 BORING REFUSAL: 36.40
 WATER TOB DEPTH @ time of drilling = 14.5 FT
 WATER 24 HR.: DEPTH _____
 WATER LOSSES _____
 CAVE-IN DEPTHS _____
 TASSING: SIZE _____ LENGTH _____
 TANDBY TIME _____ BORING LAYOUT _____
 MAY-04-2005 07:38 8655888026

METHOD OF ADVANCING BORING		DEPTH
POWER AUGER	3/4"	0 TO 36.40'
HAND SHOP: W/MUD: W/WATER		TO _____
ROTARY DRILL: W/MUD: W/WATER		TO _____
DIAMOND CORE		TO _____
CORE SIZE	NQ	56.7' TO 66.4'
UNDISTURBED SAMPLES	NO <u>4</u> SIZE <u>3"</u>	
BAG SAMPLES	NO _____	

95% P.07