	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Bor	ing Number:	B-308
Schnal	BORING		Calvert Cou	nty, Ma	ryland		Con	tract Number: 0	6120048
DEDTH	Ser Engineering EOO					s			
(FT)	STRATA DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH		TESTS	REMARKS
	wet, orange, with organic mat	ter, trace	SM				Ditit		
-	fine gravel.								
-									
-									
_						L -M	2+2+3		
20.0				77.4		l 20 M	N =5 REC =14"		
30.0 —	CLAYEY SAND, fine to mediu	ım	SC	11.1					
-	grained, moist, dark gray.								
-									
-									
_						M	2+2+3		
35.0 —				721		_ ₃₅ _0	N =5 REC =18"		
00.0	SANDY LEAN CLAY, fine, mo grav.	oist, dark	CL	723					
_	3								
-									
-									
-						M	2+3+2 N =5		
_						_ ₄₀ _	REC =18"		
_									
_									
-							REC =24"	PP=3.00 tsf	
-									
_						-45-			
_									
00/0									
- פ עני							4.5.6		
						F -1XI	4+5+6 N =11		
	contains mica.					_ ₅₀ _[/]	REC =18"		
- 10.01	unand Shallon Antonio Shallon Antonio Shallon Antonio Shallon Antonio Shallon Antonio Shallon Antonio Shallon A								
ด้ 9							REC =16"	PP=3.25 tsf	
- 1007						-55-			
9 <u>-</u>									
- International									
	continued on next pag	е							
-				I					

Comments: 1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion. 2. * = See Appendix I for additional lab testing data.

		hnabal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-308
	Schna	bel Engineering	BORING LOG	c	alvert Cou	nty, Ma	iryland			Contra Sheet:	ct Number: 06 3 of 5	6120048
	DEPTH (FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S		IG TA	TESTS	REMARKS
					CL				5.7.7			
	-							1X	N =14	18"		
	60.0 —	SILTY SAND, fir	e to medium	grained,	SM	47.1		-60-		10		
	-	, moist, dark gray,	with cemeni	eu sanu.								
	-											
	-								REC =0)''		
	-					12.1						
	05.0 -	CLAYEY SAND, gray, with fine to	fine grained coarse shell	, moist,	SC	42.1						
	_	fragments, mode	erate HCI rea	ction.								
	_											
	-							17	17+21+	50/5"		
	_							_ ₇₀ _0	REC =1	16"		
	=											
	-											
	-					22.0						
	/3.5	SILTY SAND, fir moist, dark gray,	e to medium with cement	grained, ed sand.	SM	33.0			I 50/4" N =50/4	1"		
	_							-75-	REC =1	п		
	-											
	-											
	-								50(4"			
08	-	fragments, stron	g HCl reactio	n.					N =50/4	1 "		
DT 3/6,								-80-				
BEL.GI	-											
SCHNA	_							[]				
GPJ 8	83.5	CLAYEY SAND,	fine to media	um	SC	23.6			50/2"			
0 & 400	_	grained, moist, g shell fragments,	ray, with fine moderate H0	to coarse Cl reaction.				-85-	N =50/2 REC =0	<u>2</u> "')"		
SPT 300	_											
2000	-											
20048	-											
G 061:	-								50/5" N =50/5	5"		
NG LO								-90-	REC =1	n		
TEST BORI	-	continu	ed on next pag	e								

	6	TEST	Project: Ca	alvert Cliffs	s Nucle	ar Pow	er Plant	E	Boring I	Number:	B-308
	Schnal	bel Engineering LOG	Ca	alvert Cou	nty, Ma	ryland			Contrac Sheet: 4	:tNumber: 06 4 of 5	6120048
	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		A	TESTS	REMARKS
				SC							
	-										
	- 93.5	SILTY SAND fine grained m	oist dark	SM	13.6			7+14+14			
	_	greenish gray, with fine to coa fragments, moderate HCI rea	arse shell ction.	CIVI				N =28 REC =18	u		
							_95				
	_										
	-										
	-	contains mica.					M	9+11+14			
	_						_ ₁₀₀	REC =18	"		
	-										
	-										
	- 103.5				3.6						
	-	CLAYEY SAND, fine to media grained, moist, greenish gray	um	SC			X	4+7+13 N =20			
	_						_105_L	REC - 10			
	_										
	-						M	3+5+7			
	_						_ ₁₁₀ _∐	N =12 REC =18	<u>п</u>		
	_										
	-										
3/6/08	-				-64						
EL.GDT	-	SILTY SAND, fine to medium moist, light gray, with fine to c	grained, oarse	SM	-0.4		M	15+24+50 N =74/10	0/4"		
HNABE	_	shell fragments, strong HCl re	eaction.				-115-	REC =15	~		
sPJ SC	-										
\$ 400.G	1000 500										
PT 300	_	greenish gray and white.					ה ב	34+29+2	3		
LOG SF	_	0 0 1					_ ₁₂₀	N =52 REC =18	μ		
0048 Pi	_										
3 0612	-										
NG LO(-										
T BORI	-	trace fine to coarse shell frag continued on next pag	ments, e				L _ ¤	10+19+2	1		
TES											

	TEST	Project: 0	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-308
Schna	bel Engineering LOG		Calvert Cou	inty, Ma	iryland			Contra Sheet:	ct Number: 0	6120048
DEPTH			CLASS	ELEV.	34/1	s		G	теете	
(FT)	STRATA DESCRIPT		CLASS.	(FT)	VVL	DEPTH	DA	ТА	TESTS	REIVIARNO
_	strong HCI reaction.		SM			125 X	N =40 REC =1	8"		
						[]				
128.5	CLAYEY SAND fine to medi	um	SC	-21.4			9+10+2	1		
-	grained, moist, trace fine she fragments, weak HCI reaction					F 1X	N =31	18"		
	indginente, weak nonredette					130-				
-										
-										
- 133.5				-26.4						
-	moist, greenish gray, trace fi	n grained, ne to				F 1 X	N =35	2		
_	reaction where shell fragments, wea	its are				-135-	REC =1	8		
	present									
-										
- 138.5				31.4						
-	SILTY SAND, fine to medium moist, greenish gray, few fine	e to coarse	SM			F -1X	10+10+ N =25	15		
-	shell fragments, strong HCl r	eaction.				140-1	REC =1	18"		
-										
-										
-										
-						F -1X	7+10+1 N =26	6		
						-145-1	REC =1	8"		
- 2/0/0										
- פרחו										
						╞╶┤_				
- 20						F -1X	10+17+ N =47	30		
⁵ 150.0 —	BOTTOM OF BORING @ 15	0.0 FT.		-42.9		<u> </u> -150- ∐	REC =1	8"		
8 M										
12004										
50										
BC										

Schnal	TEST Project: C bel Engineering LOG C	alvert Clif alvert Co	ffs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Borin Conti Shee	g Number : ract Number: t: 1 of 5	er: 0612	B-309
Devine C						Gro	undwater Ob	servations		
Boring C	FREDERICK, MARYLAND	5, INC.				Da	ate Time	Depth	Casing	g Caved
Boring F	oreman: D. Reese		Start	of da	у	5/	12	12.5'	14.0'	
Drilling	Method: Mud Rotary		Start	of da	y	5/	15	21.5'	14.0'	
Drilling E	Equipment: CME-75 (Truck)				.					
Schnabe	I Representative: M. Arles									
Dates \$	Started: 5/11/06 Finished: 5/12/06									
Location	Northing: 216949.24 ft Easting: 960890.7 ft									
Ground	Surface Elevation: 100.1 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	SA ТН	AMPLING DATA	TEST	s	REMARKS
0.4	ROOTMAT AND TOPSOIL.		- 99.7			M	2+2+2		D	rill hollow
-	Clayey Sand FILL, fine to medium grained, moist, brownish orange.	FILL	00.1		F	-Ŵ	N =4 REC =17"		F	ill, water loss nd hole
2.0 -	Poorly graded sand FILL, fine to coarse	FILL	98.1		F 1	1_			c d	ollapse, rillers cased
-	grained, moist, brownish orange, contains wood fragments, with clay					-MI	WOH/18" N = WOH/18"		a	uger to 14' to
_	trace silt.				L .		REC =11"		k	eep hole open
		EII 1			20-11					
_					- 5 -	M	1+WOR			
					- ·	-IXII	+WOR			
7.0			02.4				N = WOR REC =4"			
7.0 -	Silty Sand FILL, fine to coarse grained,	FILL	93.1		F					
-	moist, grayish brown, contains wood					-MI	WOH/18" N = WOH/18"			
_	nagmenta.				L	\square	REC =18"			
					<u> </u> −10-					
11.0 -	wet, brown, trace gravel.	FILL	89.1		L .	-M	WOH+2+2			
10.0	SILTY SAND, fine to coarse grained,	SM	00.4			M	N =4 REC =18"			
12.0 -	moist, brown, trace gravel.	CL	88.1		F 1					
-	SANDY LEAN CLAY, fine to coarse, moist brown				- ·	+ $+$				
5 -					L		2+2+3	PP=0.25	5 tsf	
5						IŇI	N =5 PEC =13"			
_					⊢ ^{15−}		1120 - 15			
-						-				
17.0			02.1		L					
2 17.0 -	POORLY GRADED SAND WITH SILT	SP-SM	03.1		Γ	1				
	AND GRAVEL, fine to coarse grained, moist, orangeish brown				+ +	+				
					L,	-M	7+10+11			
5						M	N =21 REC =17"			
5 —					⁻²⁰⁻					
- E					- I	-				
					Γ	1				
5 -					-	+				
2	orange.				L .		9+14+8			
24.9			75.2			١XI	N =22 REC =14"			
24.0	continued on next page		10.5		-25-		1120 - 14			

	hnabal -	Project:	Calvert Clif	fs Nucle	ar Pow	er Plant		Boring	Number:	B-309	
Schnat		BORING LOG		Calvert Cou	unty, Ma	iryland			Contra	ct Number: 06	6120048
DEPTH	STRATA [DESCRIPT		CLASS.	ELEV.	WL	s		G	TESTS	REMARKS
(F1)					(FI)		DEPTH	DA1	ГА		
_	SILTY SAND, fine moist, orange.	to medium	grained,	SM							
27.0 -		424		101/01	- 73.1						
_	grained, moist, dar	he to medii k gray.	um	SC							
							L JM	1+3+2			
							L _ M	N =5 REC =18	8"		
_											
32.0 -	SANDY LEAN CLA	Y, fine, m	oist, dark	CL	68.1						
-	gray.						╴╴┤		.		
-								REC =2.	5		
-							-35-				
-											
-											
-											
-							∏	4+4+6 N =10		PP=2.50 tsf	
_							_ ₄₀ _∐	REC =1	8"		
-											
-											
_											
_	trace sand.							REC =24	4"	PP=3.75 tsf	
_							-45-				
000											
	arav.				1			3+4+7			
	J J.				1			N =11 REC =1	8"		
					1				nni		
× 400.							F 1				
52.0 -	CLAYEY SAND, fir	ne to media	um	SC	48.1		- 1				
	gramed, moist, gre	епіяті ўгаў			1				011		
								REC =2	5		
							-55-				
5 – 9											
57.0 -	POORLY GRADE) SAND W	ITH CLAY,	SP-SC	43.1						
	fine to medium gra <i>continued</i>	ined, mois on next pag	t, grayish ^j e								
2		, - 0									

Comments: 1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion. 2. * = See Appendix I for additional lab testing data.

	6	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-309
	Schnal	BORING	c	alvert Cou	nty, Ma	iryland			Contra Sheet:	ct Number: 0	6120048
$\left \right $	DEDTU	to Engineering LOG							Gineet:	5015	
	(FT)	STRATA DESCRIPT	ION	CLASS.	ELEV.	WL	ОЕРТН			TESTS	REMARKS
F		green, with fine to coarse sh	ell	SP-SC							
	-	fragments (15-20%), HCI+, c	ontains				K	31+50/3	5" "		
	-	bemented sund.					-60-	REC =1	0"		
							Γ				
	62.0 -	CLAYEY SAND, fine to medi	um	sc	38.1						
	_	grained, moist, grayish green layers of clay and sand.	, 1/4"								
	-	,					∏	6+12+16	6		
	_						$\lfloor_{65} \rfloor$	REC =1	8"		
	_						[]				
	67.0 -	POORLY GRADED SAND, fi	ne to	SP	33.1						
	-	medium grained, moist, grayi trace silt, with fine to medium	sh green, shell								
	_	fragments (0-10%).						50/3"	.		
							70	REC =4			
	-										
	72.0 -	POORLY GRADED SAND W	/ITH SILT,	SP-SM	28.1						
	-	fine to medium grained, mois	t, green shell	LUE OF LUE OF CASE							
	_	fragments (30-40%), HCI+.	SICI				⊽	23+19+1	14		
							Ň	N =33 REC =1	6"		
	-										
	-										
	-										
	_							50/4"			
\$/08								N =50/4 REC =2	.		
0T 3/6											
EL.GD	-										
NABE	-										
SCH	_										
GPJ	_	greenish gray, with fine to co	arse shell					8+17+22	2		
§ 400		fragments (10-20%).					I of M	N =39 REC =1	8"		
300	_										
LdS 5	-										
PLOG	1997 - Sec. 19										
0048	-						$ \downarrow \downarrow$				
0612	_	with fine to coarse shell frage	nents					9+10+9			
LOG		(15-30%).						N =19	8"		
SING	_						-90- ^(_)		~		
L BOF	-	continued on next page	10								
LES]		continuou on noxt pay									

	TES	ST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	в	oring Number:	B-309
Schn	abel Engineering LO	ING C	alvert Cou	nty, Ma	ryland		C	ontract Number: 0	6120048
DEPTH (FT)	STRATA DESC	RIPTION	CLASS.	ELEV. (FT)	WL	S/	AMPLING	TESTS	REMARKS
			SP-SM	. ,		DEPTH	DATA		
	-								
	-								
	trace fine to medium she	ell fragments				M	6+7+8 N =15		
-	_					_ ₉₅ _[]	REC =18"	8	
	-								
	-								
	-								
	-					M	3+3+4 N -7		
	_					_ ₁₀₀	REC =18"		
	-								
	-								
	-								
	grayish green, with fine	to coarse shell				M	5+6+11		
						_ ₁₀₅	REC =18"	Ê	
	-								
107.0	SILTY SAND fine to me	dium arainad	CM	-6.9					
	moist, grayish green, wi	th fine to coarse							
		<i>)).</i>				M	23+10+26	i	
	_					_{—110} И	REC =18"	8	
	_								
112.0			SD SM	-11.9					
3/6/08	fine to medium grained,	moist, grayish	37-311						
GDT	fragments (10-15%), with	h silt, HCl+.				M	9+9+14 N =23		
- ABEL	-					_ ₁₁₅	REC =18"	5	
SCH	-								
00.GPJ	4								
00 & 4(-								
SPT 3(4					M	5+6+7 N =13		
PLOG	4					_ ₁₂₀	REC =18"	9	
20048	-								
122.0		ND fine to	SD.	-21.9					
la Lo	medium grained, moist,	green, trace silt.	07			- 1			
BORIN	-	vt pogo					8+8+10		
TEST	continued on ne	xi page							

Schnabel Engineering Code LOG		Project: (Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-309
Schnat	bel Engineering LOG		Calvert Cou	inty, Ma	aryland			Contra Sheet:	ct Number: 00 5 of 5	6120048
DEPTH (FT)	STRATA DESCRIP	TION	CLASS.	ELEV. (FT)	WL	DEPTH	SAMP	LING DATA	TESTS	REMARKS
_			SP			-125-	N =1	8 C =18"		
- 127.0 -	SILTY SAND, fine to mediu	n grained,	SM	-26.9						
-	moist, green, trace fine to m fragments (0-5%).	edium shell				 [7 7+7-	+9		
						_ ₁₃₀ /	REC	=18"		
132.0 -	POORLY GRADED SAND	MTH SILT, st, green,	SP-SM	-31.9						
-	(0-5%), HCI+.	agments					5+7- N =1 REC	+7 4 2 =18"		
-										
-	with fine to coarse shell frag	ments					7 4+6-	+8		
_	(10-25%).					_140_		4 C =18"		
_										
_							5+6- N =1	+9 5 ` =18"		
_						145Ľ 		, 10		
147.0 - - -	SILTY SAND, fine to medium moist, green, trace fine to m fragments (0-10%).	n grained, edium shell	SM	-46.9		 	7 5+7- N =1	+8 5		
150.0 —	BOTTOM OF BORING @ 1	50.0 FT.		-49.9		_ ₁₅₀ _/	REC	2 =18"		

50	hnabel BORING	roject: Calvert Calvert	Cliffs Nucle County, Ma	ar Pow Iryland	ver Pla	nt		Boring Contra	Number: ct Numbe	er: 0612	B-310
Schna	bel Engineering LOG							Sheet:	1 of 4		
Boring	Contractor: CONNELLY AND ASS	SOCIATES, INC.			,	Gro	oundw	ater Obs	ervations		
J J	FREDERICK, MARYL	AND				Da	ate	Time	Depth	Casin	g Caved
Boring F	Foreman: D. Bender		Enco	untere	d	6/	15		48.5'		
Drilling											
Drilling	Equipment: CME-550										
Schnabe	el Representative: K. Bell										
Dates	Started: 6/15/06 Finished: 6/15	5/06									
Locatior	n: Northing: 217081.4 ft Easting: 960616.6 ft										
Ground	Surface Elevation: 91.6 (feet)										
DEPTH (FT)	STRATA DESCRIPTION		SS. ELEV. (FT)	WL	DEP	\$/ ТН	AMPLI D	NG ATA	TEST	s	REMARKS
0.5	ROOTMAT AND TOPSOIL.		91.1				1 . 1 . 4				
-	POORLY GRADED SAND WITH fine to medium grained, moist,	H CLAY,				W	N =2 REC =	=6"			
2.0 -	orangeisn brown, trace gravei.	SC	\$ 89.6		Γ						
-	grained, moist, orangeish brown,	, trace			- ·	HXII	3+4+4 N =8				
-	root fragments, trace gravel, mod cementation.	derate					REC =	=18"			
-	yellowish brown				- 5 -	M	4+3+5	5			
-	-				-	ΗŇ	N =8 REC =	=16"			
7.0 -	POORLY GRADED SAND WITH	HCLAY, SP-S	SC 84.6		F .						
	fine to coarse grained, moist, yel	llowish				-MI	4+6+6	5			
_					L .	$ \Delta $	REC =	=15"			
											tart of mud
10.0 —	SILTY SAND, fine to medium gra	ained, SM	1 81.6		H ¹⁰⁻					r	otary drilling
-	moist, yellowish brown and orang brown.	geish				HMI	3+6+6 N =12	ò			
-	-				Ļ.		REC =	=5"			
12.0			70.0								
13.0 -	SANDY LEAN CLAY, wet, yellow	wish CL	- /0.0		Γ						
- -	brown and gray.				- ·	HXII	1+1+2 N =3	2			
- 16	4				-15-		REC =	=18"			
					[``	7					
	1				- ·	-					
-	-				-	-					
8							2+2+2	2			
					[٦XII	N =4	10"			
	1				-20-		REC =	=18			olor change in
- 10	4				L .	-				n	nud tub from
					L					C b	orangeisn prown to gray
0710											
-	1				F	1_					
- 9	4				- ·	-MI	2+2+3	3			
					-25-	M	REC =	=18"			
	continued on next page										

ſ		TEST Pro	oject: Calvert Cliffs	s Nucle	ar Pow	er Plant	Boring Number:	B-310
	Schna	bel Engineering LOG	Calvert Cou	nty, Ma	ryland		Contract Number: 0 Sheet: 2 of 4	6120048
	DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPLII DEPTH D/	NG TESTS	REMARKS
			CL			 	:18"	
	32.0 - - - - 37.0 -	ELASTIC SILT, moist, gray, trace	e sand. MH	59.6 54.6		 	:17"	
	- 	grained, moist, gray.	30			4+5+7 40	:18"	Harder drilling
3/6/08	- - 47.0 -	strong cementation	od SM	44.6		H 11+21 N =71/ REC =	+50/5" /11" :16"	Harder drilling
SPT 300 & 400.GPJ SCHNABEL.GDT	- - - -	wet, gray, trace fine to medium sh fragments, 2-5%, HCI reaction we	eak.		Ţ	⊠ 50/5" ⊠ 50/5" 50	/5" -5"	
TEST BORING LOG 06120048 PLOG 5	-	continued on next page				⊠ 50/4" N =50/ - 55 REC = 	/4" :4"	Rig chatter

		hnabol	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	1	Boring	Number:	B-310
	Schnal	hel Engineering	c	alvert Cou	nty, Ma	iryland			Contra	ct Number: 00	6120048	
E	DEDTU	ber Engineering	LUU					9		2	5014	
Ľ	(FT)	STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH		ΓΔ	TESTS	REMARKS
F					SM				0,71			
	-	gray and white, fragments 60-7	with fine to co	arse shell				M	10+13+9 N =22	9		
								_ ₆₀ _И	REC =18	8"		
	_											
	~ ~											
	62.0 -	CLAYEY SILT, I	moist, greenis	sh gray.	ML	29.6						
												Harder drilling
	-							K	4+50 N =50			
								-65-	REC =12	2"		Rig chatter
	_											, ng enemer
	-							F 1				
	-											
	-	No recovery.							50/2"	.		
	_							_70_	REC =0"			Harder drilling/rig
												chatter
	-							F 1				
	72.0 -	CLAYEY SAND	, fine to mediu	um	SC	19.6						
		grained, wet, gro contains fine to	eenish gray a coarse shell f	nd white, ragments								
	_	20-30%, HCI re	action moder	ate.				107	5+7+10			
								L_{75}	REC =18	8"		
	-											
	_											
									REC =15	5"		
80/												
T 3/6								-80-				
L.GD												
NABE	-							-				
SCH	_											
GPJ		trace fine to me	dium shell fra	gments,				L JM	5+6+8			
× 400		2-5%, HCI read	ction weak.					I IX	N =14	8"		
300 8	_							85-4				
SPT	-											
PLOG	_											
0048	_											
0612(4+4+8			
00								□	N =12	o"		
ING								<u>⊢90</u> – ⊔		D		
BOR	_	continu	ied on nevt pag	e.								
TEST		Contine	ica on non pay	~								

	bachal	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-310
School		BORING		Calvert Cou	nty, Ma	iryland			Contra	ct Number: 0	6120048
DEDTU	bei Engineering	LUG							Sneet:	4 01 4	
(FT)	STRATA	A DESCRIPT	ION	CLASS.	ELEV.	WL			ТА	TESTS	REMARKS
				SC							
-											Rig chatter
_											
_	white and gray, v	with fine to co	oarse shell				¤	50/5"			
	fragments, 60-70 cementation_HC	0%, strong I reaction str	ona					N =50/5			
_			og.				-95-				Rig chatter
-											
-											
-											
_	contains fine to r	nedium shell					10	27+27+	26		
100.0	fragments, 10-20 moderate.	0%, HCI read	ction		0.1			N =53 REC =1	8"		
100.0 —	BOTTOM OF BO	DRING @ 10	0.0 FT.	1	-8.4			-	-		
0											
2/0/1											
i n											
ABEL											
NHO											
400.0											
8											
LOC											
1040											
100121											
20											
Da											
2											

Schna	TEST Project: C BORING C Ibel Engineering LOG	alvert (alvert (Cliffs N County	vuclea y, Mai	ar Pow ryland	er Plai	nt		Boring Contra Sheet:	Number: ct Number 1 of 5	er: 06120	B-311
Boring (Gro	oundw	ater Obs	ervations		
Bonnig	FREDERICK, MARYLAND	, INC.				1	D	ate	Time	Depth	Casing	Caved
Boring I	Foreman: D. Bender		E	Encol	untere	d	5/	/15		23.5'		
Drilling	Method: Mud Rotary			Start	of day	,	5/	/16		10.0'		
Drilling	Equipment: CME-550X (ATV)				~							
Schnab	el Representative: K. Bell											
Dates	Started: 5/15/06 Finished: 5/16/06											
Locatio	n: Northing: 217268.61 ft Easting: 960771.76 ft											
Ground	Surface Elevation: 58.4 (feet)											
DEPTH (FT)	STRATA DESCRIPTION	CLAS	ss. El	LEV. FT)	WL	DEP	S/ ТН	AMPLI D	NG ATA	TEST	s	REMARKS
	ROOTMAT AND TOPSOIL.						\top					
0.8	POORLY GRADED SAND WITH SILT, fine to medium grained, moist, yellowish brown, trace root fragments	SP-S	SM 5	57.6		 		1+1+1 N =2 REC =	=14"			
-	yellowish brown and brown, with wood fragments.						-1	4+3+2 N =5	2			
-								REC =	=8"			
-	-						-M	1+3+5 N =8 REC =	5 =0"			
7.0 -	FAT CLAY with sand, moist, orangeish brown and gray, trace root fragments	CH	1 5	51.4				2+4+5	5			
-							X	N =9 REC =	=12"			
1	-					-10-		4.2.5	-			
- 12.0	-			16.4			X	N =8 REC =	- =17"			
-	SILTY SAND, fine to medium grained, moist, gray.	SN	1									
-	-						-M	6+9+1 N =19 REC =	0 			
-	-					- 15-						
-	-						$\left \right $					
5	gray and greenish gray.							4+5+9	9			
-						-20-	M	N =14 REC =	=20"			
	-			86.4							Ha	arder drilling
- 22.0	POORLY GRADED SAND WITH SILT, fine to medium grained, wet, gray and greenish gray.	SP-S	SM 3	0.4	∇							
-					<u>+</u>		\mathbb{N}	10+15 N =32	5+17			
	continued on next page					-25-		REC -	-15			

		TEST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-311
	Schna	bel Engineering LOG	Calvert Cou	nty, Ma	ryland		Contract Number: 0 Sheet: 2 of 5	06120048
	DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS
	0.51 0.04		SP-SM					
	-	trace fine to medium shell fragments,					+15	
	_	To reactor weak.				-30 M REC =	14"	
	-							
	32.0 -	SILTY SAND, fine to medium grained, wet, gray and white, with fine to coarse	SM	26.4				
	-	shell fragments, HCl reaction strong.					+18	
	-					-35 M REC =	12"	
	-							
	37.0 -	SANDY LEAN CLAY, moist, greenish	CL	21.4				
	-	fragments, HCI reaction moderate.					+50/3"	
						0 N =72/ REC =	9" 21"	
	-							
	42.0	CLAYEY SAND, fine to coarse grained,	SC	16.4				
		coarse shell fragments, HCI reaction moderate, weak cementation.				 ∭ 11+19•	+17	
	_					X N =36 REC =	17"	Harder drilling
T 3/6/08	47.0	SILTY SAND, fine to medium grained,	SM	11.4				
BEL.GD	-	to coarse shell fragments, HCl reaction weak.				 M 4+4+6		
SCHNA	_					N =10 _50 REC =	14"	
00.GPJ								
300 & 4(
JG SPT	-							
048 PLC	-						14"	
3 06120	-							
NG LOC								
ST BORI	-	continued on next page						
μ.								

	6	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number: B-311		
	Schnak	BORING C	alvert Cou	nty, Ma	ryland		Contract Number: 0	6120048	
	DEDTU					CAMDLU			
	(FT)	STRATA DESCRIPTION	CLASS.	ELEV.	WL		TESTS	REMARKS	
			SM						
	-	greenish gray.							
	_						17"		
	_					[]]			
	-								
	-								
	-					$ M _{+4+7}^{4+4+7}$			
	_						18"		
	-								
	67.0 -	CLAYEY SAND, fine to medium	SC	-8.6					
	-	grained, wet, light gray and white, with fine to coarse shell fragments. HCI							
	_	reaction strong.				⊠ _{50/3"}			
						REC =	2"		
	-								
	72.0 -	SILTY SAND, fine to medium grained,	SM	-13.6					
	-	wet, greenish gray, trace fine to coarse	35,042,04.0						
	-	shell haginents, norreaction moderate.					+23		
						N =40 REC =	17"		
	-								
	-								
	-								
	_	HCI reaction weak.				8+12+	15		
\$/08						N =27	18"		
0T 3/6									
IL.GD	-								
NABE	-								
SCH	-								
GPJ.	_	greenish gray and white, HCI reaction					0		
\$ 400	~~	moderate.				N =18	18"		
300 5	_								
SPT SPT	-								
PLOG	87.0 -	SANDY ELASTIC SILT wat arey and	мн	-28.6					
0048	_	greenish gray.							
0612						6+7+1	o		
LOG	1					N =17	18"		
SING	_								
BOF	-	continued on next nade							
TESI		contract on non page							

		TEST Project: Calvert Cliffs Nuclear Power Plant BORING Calvert County, Maryland								oring Number:	B-311
	Schn	abel Engineering	LOG	c	alvert Cou	nty, Ma	ryland		C	ontract Number: (heet: 4 of 5	06120048
	DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	- SAMPLII		TESTS	REMARKS
	-	- trace fine to me (5%), HCl react	dium shell fra ion weak.	gments	МН			 95 -	6+8+12 N =20 REC =18"		
	-	greenish gray						 - <u>100-</u>	7+14+12 N =26 REC =18"		Resumed drilling 5/16/06 @ 7:15am
	102.0	SILTY SAND, fi wet, greenish g to coarse shell f HCI reaction str	ne to medium ray and white fragments (35 onng.	grained, and fine -45%),	SM	-43.6		 105-	11+12+31 N =43 REC =20"		
	107.0	LEAN CLAY wit gray and white, shell fragments moderate.	th sand, wet, g trace fine to r (2-5%), HCI	greenish nedium reaction	CL	-48.6		 110-	7+7+10 N =17 REC =19"		
.OG 06120048 PLOG SPT 300 & 400.GPJ SCHNABEL.GDT 3/6/08	-	- trace fine to me (5-10%). - - -	dium shell fra	gment				 	5+7+10 N =17 REC =19"		
TEST BORING L		trace fine to me	dium shell fra ued on next pag	gments re				 ⊠	5+7+9		

	50	hnabel BORING	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-311
1	Schna	bel Engineering LOG			inty, ivia	ryianu			Contrac Sheet:	S of 5	5120048
	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLING	G G	TESTS	REMARKS
	-	(2-5%), HCl reaction weak.		CL			X	N =16 REC =1	8"		
	-	greenish gray.					 _130-	5+7+9 N =16 REC =2	0"		Softer drilling
	132.0 - - - -	FAT CLAY with sand, moist, gray and gray.	greenish	СН	-73.6		 	7+9+12 N =21 REC =2	1"		
	- - -	trace fine to medium shell fra (<5%), HCl reaction weak.	gments				 -140-	7+9+12 N =21 REC =1	9"		
DT 3/6/08	-	trace fine to medium shell fra (5%).	gments				 145-	6+7+11 N =18 REC =2	0"		
300 & 400.GPJ SCHNABEL.GE	- - 150.0 —	trace fine to medium shell fra (<5%). BOTTOM OF BORING @ 15	gments 0.0 FT.		91.6		 	9+10+13 N =23 REC =2	3 0"		
EST BORING LOG 06120048 PLOG SPT											

Sc	hnabel BORING	Project: Calver Calver	Cliffs Cou	s Nucle nty, Ma	ar Pow ryland	er Plar	nt		Boring Contra	Number: ct Numbe	er: 061	1200	B-312
Schnal	bel Engineering LOG								Sheet:	1 of 4			
Boring C	Contractor: CONNELLY AND A	ASSOCIATES, INC					Gro	oundv	vater Obs	ervations			
J	FREDERICK, MAR	RYLAND					D	ate	Time	Depth	Casi	ng	Caved
Boring F	oreman: D. Bender			Enco	untere	d	5	/18		23.5'		į.	
Drilling													
Drilling	Equipment: CME-550X (ATV)		-										
Schnabe	el Representative: K. Bell												
Dates	Started: 5/18/06 Finished: 5	5/18/06											
Location	I: Northing: 217293 ft Easting: 960740 ft												
Ground	Surface Elevation: 55.3 (feet)												
DEPTH (FT)	STRATA DESCRIPT		SS.	ELEV. (FT)	WL		S	AMPL	ING	TEST	s	R	EMARKS
				e 17		DEP	TH		DATA				
0.5			SM	54.8		L.		woh+	1+2				
	fine to medium grained, moist	t, yellowish					IXI	N=3	-15"				
2.0 -	brown, trace root fragments.	c	Н	53.3				NEC.	-15				
-	FAT CLAY, moist, yellowish b	prown and					-MI	2+3+	4				
_	fragments.					L.	Μ	REC	=11"				
						- 5 -	M	3+4+	5				
							HXII	N =9					
								REC	=0*				
									-				
	orangeish brown and gray, tra	ace wood					HMI	2+3+ N =6	3				
	indginento.						$ \Omega $	REC	=13"				
-						-10-							
-								REC	=21"	PP=>4.3	o tst		
120 -				43.3		L .						Colo	r change in
12.0	ELASTIC SILT with sand, mo	ist, dark 🛛 🕅 🛛	H	40.0								brow	n to gray
-	gray.												
- 10							-MI	3+4+	8				
						15	M	REC	∠ =18"				
פ עני						- 13-							
							+						
17.0 -				38.3		L .						Colo	r change in
	SILTY SAND, fine to medium	grained, S	М									tub f	rom gray to
	odor, weakly cemented with n	no HCI										brow	/n
- -	reaction.						HXI	38+5 N =50	0/5" \/5"				
<u> </u>						L_20_		REC	=10"				
ก้ ว						20							
-													
22.0 -			CN4	33.3			$\left \right $						
	fine to coarse grained, wet, lic	n H SiLi, SP- ght gray, I	SIVI										
2	trace fine to medium shell frag	gments			$\overline{\Delta}$			50					
- 19								SU REC	=10"				
	and an art					-25-			ana and				
0	continued on next pag	e											
	1					I							

		TEST	Project: Ca	Calvert Cliffs Nuclear Power Plant Calvert County, Maryland					Boring Number: B-312		
	Schna	bel Engineering LOG	C	alvert Cou	nty, Ma	ryland			Contra Sheet:	ct Number: 06	6120048
ł	DEPTH				FL EV.		ş		G		
	(FT)	STRATA DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DA	TA	TESTS	REMARKS
				SP-SM							
		-									
		-									
		trace fine to medium shell frag	gments					50/5"	54		
	_						-30-	REC =5	5"		
		-									
	32.0				23.3						
	02.0	ELASTIC SILT with sand, we trace organic matter and fine	t, gray, to medium	MH	20.0						
		shell fragments (2-5%), HCl r weak	eaction					4+4+6			
							X	N =10	5"		
							-35- Ľ				
		-									
	,	-									Dia chattar
		-									Rig chatter
								REC =0	ייט		
	_						-40-				
		-									Rig chatter
	42.0				13.3						rig chatter
	.2.0	SILTY SAND, fine to coarse g wet, greenish gray and gray,	rained, trace fine	SM	10.0						
		to coarse shell fragments (15 HCI reaction moderate.	-20%),				N	4+6+12			
							T _ TX	N =18	8"		
	_						-45- Ľ				
80	,										
3/6/0		-									
L.GDT	,	-									
NABE		greenish gray and white.					\	6+8+14 N =22			
SCH	_	-					_ ₅₀ _//	REC =1	7"		
0.GPJ	:	-									
J & 40		4									
PT 300											
OG SI		greenish grav. trace fine to co	arse shell					6+5+8			
)48 PL	,	fragments (10-15%).					T 1 X	N =13	7"		
16120C	-	1					-55- - -				
0 90.	;	1									
RINGL	57.0	CLAYEY SAND, fine to media	um _	SC	-1.7						
T BOF		grained, wet, greenish gray, t continued on next pag	race fine to e								
TES		versen bester en	~~								

	6	hnabel TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Bori	ng Number:	B-312
	Schnal	bel Engineering LOG	C	alvert Cou	nty, Ma	ryland		Con	tract Number: 0	6120048
	DEPTH			CLASS	ELEV.	3471	S	AMPLING	теете	
	(FT)	STRATA DESCRIPT		CLASS.	(FT)	VVL	DEPTH	DATA	TESTS	REWARKS
	-	medium shell fragments (2-5 reaction weak.	%), HCI	SC			 []	3+4+5 N =9 REC =15"		
	62.0 - - - -	SANDY FAT CLAY, wet, gree trace fine to coarse shell frag (30-40%), HCl reaction stron	enish gray, ments g.	СН	-6.7		 - 65 -	5+7+11 N =18 REC =18"		
	67.0 - -	SILTY SAND, fine to coarse wet, gray and white, with cen sand, HCl reaction strong.	grained, nented	SM	-11.7		 M	47+10+7		Rig chatter
	69.5	CLAYEY SAND, fine to coars wet, greenish gray and white to coarse shell fragments (30 HCI reaction strong.	se grained, , trace fine 0-40%),	SC	-14.2		Ŭ 	N =17 REC =16"		
		fine to medium grained, gree and light gray, trace fine to m shell fragments (5-15%), HC moderate.	nish gray ledium Il reaction		01.7			17+26+29 N =55 REC =18"		
ABEL.GDT 3/6/08		SANDY ELASTIC SILT, wet, gray, trace fine to coarse she fragments (10-20%), HCI rea moderate.	greenish II action	МН	-21.7		 	4+6+11 N =17 REC =17"		
PLOG SPT 300 & 400.GPJ SCHN		greenish gray and white, trac medium shell fragments (5-1 reaction weak.	e fine to 0%), HCl				 	7+8+13 N =21 REC =18"		
RING LOG 06120048	-	with sand, trace fine to mediu fragments (2-5%).	ım shell				 M	7+9+12 N =21 REC =20"		
FEST BOH	-	continued on next pag	<i>je</i>							

	hnahal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-312
Schnal	bel Engineering	BORING LOG	C	alvert Cou	nty, Ma	ryland			Contra Sheet:	ct Number: 06	6120048
DEPTH	страт			CI A 22	ELEV.	14/1		SAMPLIN	IG	тгото	
(FT)	SIRAI	A DESCRIPT	ION	CLASS.	(FT)	VVL	DEPT	H DA	TA	TESTS	REMARKS
				MH							
-											
-								N =12	001		
_							-95-1		20		
-											
-								REC =	12"	PP=>4.5 tsf	
							-100-				
100.5	BOTTOM OF B	ORING @ 10	0.5 FT.		-45.2						
00/00											
° mc											
2004											
8											
2											

Schna	Chrabel TEST Project: C. BORING C bel Engineering LOG	alvert Cli alvert Co	ffs Nucle ounty, Ma	ear Pov aryland	ver Pla	int		Boring Contra Sheet:	Number: Inct Number 1 of 5	er: 06120	B-313
Boring C	Contractor: UNI-TECH DRILLING					Gro	oundw	ater Obs	ervations		
Ĵ	MALAGA, NEW JERSEY					D	ate	Time	Depth	Casing	Caved
Boring F	Foreman: J. Blemings		Enco	untere	ed	5	/19		8.7'		
Drilling I	Method: Mud Rotary		Star	t of da	v	5,	122		20.0'		
Drilling I	Equipment: CME-750 (ATV)	-			•	_					
Schnabe	el Representative: K. Megginson		Star	t of da	У	5	123		0.0		
Dates	Started: 5/19/06 Finished: 5/22/06		Water	Readi	ng	7	127		20.3'		
Location	1: Northing: 217372.34 ft Easting: 960713.67 ft										
Ground	Surface Elevation: 50.7 (feet)										
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV.	WL	DEP	s/ ртн	AMPLI D	NG ATA	TEST	s	REMARKS
0.5	Forest litter, rootmat and topsoil.		50.2		1	M	WOH	+1+1	w=9.9'	%	
-	SILTY SAND, fine to coarse grained, moist, brown, contains root fragments.	SM	40.7		F	-Ŵ	N =2 REC =	=13"			
2.0 -	Sandy SILTY CLAY, fine to medium	CL-ML	. 48.7		–			1014	w=11.8	%	
	organic matter, contains root fragments.				-	IXI	N =3	+2+1	LL=19	9	
	-		40.0		-		REC =	=10"	FL-14	*	
4.5	FAT CLAY, moist, light orangeish brown	СН	46.2		- 5 -		0.4.		w=27.6	%	
_	sand.				L		2+4+2 N =8	ł	LL=67	7	
							REC =	=18"	PL=2'		
7.5			43.2		Ē				w=15.1	0/2	
	Sandy LEAN CLAY, light gray and orangeish brown, with fine to medium	CL	036236503		-	HXII	3+4+6 N =10	5	LL=30	2	
8.7 -	sand.	SM	42.0	<u>×</u>	-		REC =	=13"	PL=1		
9.5	SILTY SAND, fine to medium grained, wet, grayish brown and brown.	ML	41.2		-10-	┥					
-	SANDY SILT, fine to medium, wet, light grayish brown and orangeish brown.				-	-M	2+3+3 N =6	3	w=27%	*Sl	ight drill rig
-					-		REC =	=17"		11.	5 to 13.5 ft.
-	liekterrick krown vollewick krown and				-		2.2.2	5	w=31.5	%	
	orangeish brown, trace mica.				F 1	HXII	2+2+2 N =4	2	*		
-					-15-		REC =	=16"			
-					L.	-					
170 -			33.7		L						
17.0	POORLY GRADED SAND, fine to	SP-SM	1								
-	silt.				F				W-22 1	06	
-	4				-	-M	4+11+ N =26	-15	vv=∠3.1 *	70	
					-20-	- 121	REC =	=16"			
_					L.						
			0.00-								
22.0 -	SILTY SAND, fine to medium grained,	SM	28.7		[]	1					
	wet, dark orangeisn brown.				F					~	
-	4				-	-M	16+17 N = 27	7+10	w=21.1 LL=NI	% >	
_					-25-	_M	REC =	=15"	PL=N		
	continued on next page										
					1						

Comments:
1. Ground water observation well OW-313B installed in boring upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-313A installed at nearby location.

	6	hnabel Doping	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-313
	Schnat	bel Engineering LOG	C:	alvert Cou	nty, Ma	ryland			Contrac Sheet:	t Number: 06 2 of 5	6120048
	DEPTH	STRATA DESCRIPT	ION	CLASS.	ELEV.	WL	÷		G	TESTS	REMARKS
	6.5			SM			DEPTH			*	
	-										
	-										
	-	gray mostly fine to coarse st	nell					11+14+	14	w=18.2%	
		fragments (±60%), strong HC contains black particles (<1/1	l reaction, 6 inch).					N =28 REC =1	16"	LL=NP PL=NP *	
	32.0 -	SANDY EAN CLAY moist	aray with		18.7						
	-	fine to medium sand, weak H reaction.									*Switched to 3-7/8" Tri-cone
	33.9 _	SILTY SAND, fine to medium	grained,	SM	16.8		¤	50 REC =6	5"	w=28.1% LL=38 PL=21	roller bit below 33.5 ft.
		sand (±95%), moderate HCl	reaction.				-35-			*	[^] Very to extremely difficult rotary
	-										advancement from 34 to 35.5
	-										ft (strong rig chatter). *Mederate
	-	wet, oliveish gray, little fine to	coarse				X	24+50/4	4"	w=17.1%	difficulty with rotary
	_	cemented sand pockets, stro reaction.	ng HCl				-40-	REC =1	io"		advancement from 35.5 to
	41.0 -	SANDY SILT, fine to medium	grained,	ML	9.7						37.5 π. *Very difficult rotary
	-	wet, gray, few fine to coarse fragments (±10%), contains s	shell silty sand								advancement from 37.5 to 38
	-	pooreis, wear norreadion.						4+5+6		w=29.3%	ft (moderate to strong rig chatter)
	l						_ ₄₅ _/	N =11 REC =1	18"	LL=34 PL=27 *	*Moderate to difficult rotary
	_										advancement from 40.5 to 41 ft (moderate rig
3/6/08	47.0 -	SILTY SAND. fine to medium	grained.	SM	3.7						chatter).
EL.GDT	-	wet, greenish gray and gray, coarse shell fragments (±10%	few fine to 6),	5454/29/5075				1		w-27.0%	
CHNAB	_	moderate HCI reaction.)	6+7+8 N =15 REC =1	18"	w-21.370 *	
GPJ S(_						50Ľ				
0 & 400.	52.0 -		and the second s		-1.3						
SPT 30	-	SILTY SAND, fine to medium wet, greenish gray and gray, reaction, contains black partie	i grained, weak HCl cles (<1/16	SM							
3 PLOG	-	inch).					\	5+6+9 N =15		w=31.5% LL=NP	**Doormod
6120048	_	trace fine to medium shell fra (±5%) below 54.8 ft.	gments				_ ₅₅ _/	REC =1	18"		drilling at 8:40 AM on 5/22/06.
LOG 0	-	· · · · · · · · · · · · · · · · · · ·									
ORING	-										
TEST B		continued on next pag	<i>pe</i>								

Comments:

Ground water observation well OW-313B installed in boring upon completion.
 * = See Appendix I for additional lab testing data.
 Ground water observation well OW-313A installed at nearby location.

	hnabel TEST	Boring	Number:	B-313					
Schnal	bel Engineering LOG		alvert Cou	inty, ivia	ryland		Contra Sheet:	ct Number: 06 3 of 5	6120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	SA DEPTH	MPLING DATA	TESTS	REMARKS
-	light greenish gray and gray, to coarse shell fragments (±5	trace fine i%).	SM			 	3+5+9 N =14 REC =18"		
62.0 - - - -	SANDY LEAN CLAY, fine to wet, gray and light gray, mos coarse shell fragments (±60% clayey sand pockets, strong reaction.	medium, tly fine to 6), contains HCI	CL	-11.3		 	11+14+50/5" N =64/11" REC =17"	w=26.2% LL=33 PL=17 *	*Moderate to difficult rotary advancement from 65 to 67 ft (moderate to strong rig chatter)
67.0 - - - -	SILTY SAND, fine to medium wet, gray, little fine to mediur fragments (±20%), strong HC	i grained, n shell I reaction.	SM	-16.3		 	6+13+22 N =35 REC =18"		
72.0 - - - -	SANDY SILT, fine to medium light greenish gray and gray, to coarse shell fragments (±5 moderate HCI reaction.	i, moist, trace fine %),	ML	-21.3		 75-	5+10+16 N =26 REC =18"	w=28.4% *	
- 77.0 - - - - - - -	CLAYEY SAND, fine to medi grained, moist, greenish gray to coarse shell fragments (±1 contains cemented shell poc strongly cemented sand laye to 77.8 ft, strong HCI reaction	um r, few fine 0%), kets and r from 77.7 n.	SC	26.3		 \Box _ - 80 	50/4" N =50/4" REC =4"		
G SPT 300 & 400 GPU SCHNAB 0.78 	SANDY ELASTIC SILT, fine moist, greenish gray, trace m HCI reaction.	to medium, iica, weak	MH	-31.3		 85-	5+6+13 N =19 REC =18"	w=37.3% *	
- 0.78 BORING LOG 06120048 PLC	ELATIC SILT, moist, light gre trace fine to medium sand, m fine to medium shell fragmen weak HCl reaction.	eenish gray, iica and ts (±1%),	MH	-36.3		 	7+9+12 N =21 REC =18"	w=55% LL=98 PL=47 *	
TEST	continued on next pag	<i>je</i>							

Comments:
1. Ground water observation well OW-313B installed in boring upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-313A installed at nearby location.

1	6	hnabel TEST	Project: C	Calvert Cliffs Nuclear Power Plant						Boring Number: B-31		
	Schnal	bel Engineering LOG	C	alvert Cou	nty, Ma	iryland			Contra Sheet:	ct Number: 06 4 of 5	6120048	
	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLIN	G TA	TESTS	REMARKS	
	92.0 -	LEAN CLAY, gray, with fine t sand, trace mica, weak HCl r trace fine to coarse shell frag (±<5%).	o medium eaction, ments	MH	-41.3]	REC =1	4"	w=35.6% LL=49 PL=25 PP=>4.5 tsf	*Shelby tube sampler push from 93.5 to 94.7 ft.	
	- 97.0 - - - -	SANDY SILT, moist, dark gr fine to coarse shell fragment trace mica, weak HCI reactio	ay, some s (±40%), n.	ML	-46.3		 - 100-	8+13+11 N =31 REC =1	8"	w=32.4% LL=42 PL=28 *		
	102.0 - - - -	SANDY ELASTIC SILT, fine moist, dark greenish gray, tra medium shell fragments (±<5 mica, moderate HCI reaction	to medium, ice fine to %), trace	MH	-51.3		 -105-	6+8+12 N =20 REC =1	8"	w=43.4% LL=70 PL=45 *		
	-	trace fine to medium sand ar moderate HCI reaction.	ld mica,				 110- 	6+10+1 ⁻ N =21 REC =1	1 8''	w=57.7% LL=106 PL=55 *		
SCHNABEL.GDT 3/6/08	-	with fine to medium sand, tra and fine to coarse shell fragn (±5%), moderate HCl reactio	ce mica nents n.				 	6+10+1: N =22 REC =1	2 8"	w=44.3% LL=72 PL=46 *		
\$120048 PLOG SPT 300 & 400.GPJ	- - -	weak HCI reaction.					 120-	5+8+11 N =19 REC =1	8"	w=43.5% LL=81 PL=42 *	*Considered pushing tube at 118.5 ft, but drilling resistance increased from 117.5 to 118.5 ft.	
FEST BORING LOG 0	122.0 -	CLAYEY SAND, dark greenis trace mica, contains indurate pockets, weak HCI reaction. <i>continued on next page</i>	sh gray, d sandy silt ge	SC	-71.3		 	REC =1	0"	w=33.1%	*Shelby tube	

Comments:

Ground water observation well OW-313B installed in boring upon completion.
 * = See Appendix I for additional lab testing data.
 Ground water observation well OW-313A installed at nearby location.

6	hnabel	TEST	Project: Ca	Calvert Cliffs Nuclear Power Plant						Boring Number: B-313			
Schnat	bel Engineering		Ca	alvert Cou	nty, Ma	ryland			Contra Sheet:	5 of 5	6120048		
DEPTH (FT)	STRATA DE	SCRIPTIC	NC	CLASS.	ELEV. (FT)	WL	DEPTH	SAMPLIN	IG ATA	TESTS	REMARKS		
				SC			125 			LL=44 PL=26 PP=>4.5 tsf *	sampler push from 123.5 to 124.3 ft.		
127.0 - - - - -	ELASTIC SILT, dark trace mica, contains pockets, weak HCL r	greenish s indurated eaction.	gray, sandy silt	MH	-76.3		 - 130- 	7+9+12 N =21 REC =	2 18"	w=66% LL=132 PL=60 *			
-							 135- 	8+10+ ⁻ N =21 REC = ⁻	1 18"	w=69.1% *	*Relatively slow rotary advancement below 135 ft.		
					-91 3		 [- 140- 	7+8+12 N =20 REC =	2 18"	w=62.9% LL=106 PL=51 *			
-	Sandy FAT CLAY, m trace fine to medium weak HCl reaction.	noist, greei sand, and	nish gray, I mica,	СН	01.0		 	7+11+′ N =25 REC ='	14 18"	w=49.1%	** De sum s d		
- - 150.0 —	dark greenish gray, r reaction. BOTTOM OF BORIN	noderate I NG @ 150.	HCI .0 FT.		-99.3		 	7+12+' N =26 REC =	14 18"	w=49.4% LL=103 PL=30 *	observation well construction for SPT borehole at 7:00 AM on 5/23/06.		

Comments:
1. Ground water observation well OW-313B installed in boring upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-313A installed at nearby location.

Schnal	TEST Project: C bel Engineering LOG C	alvert Cl alvert Co	liffs Nucle ounty, Ma	ar Pow ryland	ver Pla	nt	-	Boring Contra Sheet:	Number: Ict Number 1 of 4	er: 0612	B-314 20048
Deviner C						Gro	oundwat	er Obs	ervations		
Boring C	FREDERICK. MARYLAND	, INC.				D	ate -	Гime	Depth	Casin	d Caved
Boring F	oreman: D. Bender		Enco	untere	d	5	/16		3.5'		
Drilling I	Method: Mud Rotary		Start	of day	v.	5	/17		10.5		
Drilling I	Equipment: CME-550X (ATV)	-	0.011	or au	,				10.0		
Schnabe	el Representative: K. Bell										
Dates 3	Started: 5/16/06 Finished: 5/17/06	Γ									
Location	: Northing: 217321.89 ft Easting: 960654.5 ft	F									
Ground	Surface Elevation: 52.8 (feet)										
DEPTH (FT)	STRATA DESCRIPTION	CLASS	s. ELEV. (FT)	WL	DEP	S/ TH	AMPLING DA1	G FA	TEST	s	REMARKS
0.4	ROOTMAT AND TOPSOIL.		52.4					511	w=9.79	%	
-	SILTY SAND, fine to medium grained, moist, yellowish brown, trace silt and root fragments	SM				W	N = WO REC =6	;" H/18" '	*	70	
	fine to coarse grained, wet, trace gravel.		40.2	∇		-M	2+2+5 N =7		w=14.1 LL=NF	%	
- 3.5	FAT CLAY with sand, moist, orangeish brown and gray, trace root fragments.	СН	49.5	-			REC =1	5"	PL=NI *		
_					- 5-		1+2+3 N =5 REC =1	.	w=35% LL=73 PL=25	% 3 5	
-							REC -1	2	*	96 5	Started drilling
-						IM	2+4+5 N =9 REC =19	9"	LL=59 PL=27)) 1 (:30am Color change in
_					-10-		5+7+9		w=26.2	10 17 18 18 19	ub, ellow/brown to ray below 10
_						Ň	N =16 REC =19	9"	LL=73 PL=25	5	
- 13.5	CLAYEY SAND, moist, light gray and	SC	- 39.3				REC =1	2"	w=25.9	%	
	gray.				-15-				LL=54 PL=11 PP=>4.5	tsf	
_						1				H	larder drilling
17.0 -	SILTY SAND, fine to medium grained,	SM	35.8		F '					a	ו דכ.סו.
-	wet, greenish gray and white, trace fine to medium shell fragments (5%), HCl reaction weak								w=24.2	%	
-					-	W	N =50/5 REC =1	' 1"	*		
]					
22.0 -			30.8		Ļ,	$\left \right $					
	SILTY SAND, fine to medium grained, wet, light gray and white, trace fine to medium shell fragments (5-10%), HCI reaction moderate .	SM				-8	29+50/5 N =50/5'		w=22.6 LL=NF	%	
_	continued on next page				-25-	$\left \right $	REC =1:	3"	PL=NI		
. <u> </u>					I						

	6	hnahel	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	В	Boring Number: B-31	
-	Schna	bel Engineering	LOG	C	alvert Cou	nty, Ma	iryland		C S	ontract Number: heet: 2 of 4	06120048
D	EPTH (FT)	STRATA	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLING	TESTS	REMARKS
					SM					*	
:	27.0 -	SILTY SAND, fir wet, gray and wh shell fragments (ne to coarse (nite, with fine (60-70%), HC	grained, to coarse I reaction	SM	25.8		 	40.40.47	, w=20.3%	
	-	strong.						 	N =27 REC =15"	*	
(32.0 - - -	Sandy LEAN CL greenish gray.	AY with sand	l, moist,	CL	20.8		 M	3+4+6	w=25.4%	
	-					15.0		_ ₃₅ 	REC =20"	PL=22	Rig chatter at 36.5 ft.
	- 37.0 - -	SILTY SAND, fir wet, gray and gro to coarse shell fr reaction strong, coarse grained s 39.9-40.0 ft).	ne to medium eenish gray, agments (25 (50-60% mec hell fragmen	grained, trace fine -30%), HCI lium to ts from	SM	15.8		 - 40-	5+5+50/3' N =55/9" REC =19"	w=26.8% LL=NP PL=NP *	
	-					 	4+4+7 N =11 REC =16"	w=31.9%			
J SCHNABEL.GDT 3/6/08	-							 	5+9+7 N =16 REC =18"	w=25.4%	
120048 PLOG SPT 300 & 400.GP	- 52.0 - - -	SILTY SAND, fir wet, gray and gr to medium shell reaction weak.	ne to medium eenish gray, fragments (2	grained, trace fine -5%), HCl	SM	0.8		 	4+4+6 N =10 REC =18"	w=32.8% LL=NP PL=NP *	
TEST BORING LOG 06	- 57.0 - -	POORLY GRAD fine to medium g continu	ED SAND, tr irained, wet, ed on next pag	ace silt, gray and e	SP	-4.2					

	test	Project: Ca	lvert Cliffs	s Nucle	ar Pow	er Plant	Bor	Boring Number: B-314		
Schn	abel Engineering LOG	Ca	ivert Cou	nty, ivia	iryiand		Cor She	ntract Number: 00 eet: 3 of 4	6120048	
DEPTH (FT)	STRATA DESCRIPTI	ION	CLASS.	ELEV. (FT)	WL	S/ DEPTH	AMPLING DATA	TESTS	REMARKS	
	greenish gray, trace fine to me shell fragments (2-5%), HCl re weak.	edium eaction	SP			[] [] 	3+4+6 N =10 REC =16"	w=33% LL=NP PL=NP *		
62.0	SANDY FAT CLAY with sand, greenish gray and white, trace coarse shell fragments (35-45 reaction strong.	, wet, e fine to i%), HCI	СН	-9.2		 65 -	3+5+8 N =13 REC =18"	w=40.3% LL=59 PL=24 *		
67.0	SANDY SILT, fine to coarse g wet, greenish gray and white, to medium shell fragments (10 HCI reaction moderate.	rained, trace fine)-15%),	ML	-14.2		 	5+11+17 N =28 REC =18"	w=19.5% LL=NP PL=NP *	Rig chatter at 67.5 ft.	
	fine to medium grained, gray a greenish gray, trace fine to me shell fragments (2-5%), HCl r weak.	and edium eaction				 	8+13+16 N =29 REC =15"	w=27.9% LL=NP PL=NP *		
ABEL.GDT 3/6/08	greenish gray and white, trace medium shell fragments (20-3 reaction moderate.	e fine to 10%), HCI				 X 80 	13+50/5" N =50/5" REC =16"	w=36.5% LL=NP PL=NP *		
5 SPT 300 & 400.GPJ SCHN	SANDY ELASTIC SILT, trace medium shell fragments (15-2 reaction moderate.	fine to 0%), HCl	MH	-30.7		 	5+7+11 N =18 REC =18"	w=41.2% LL=57 PL=36 *		
0.78 PLOG 06120048 PLOG	SANDY FAT CLAY, wet, gree and, trace fine to medium she fragments (<5%), HCI reactio (strongly cemented lense at 8 exhibits strong HCI reaction).	nish gray II n weak, 9.6 ft	СН	-34.2		 90-	8+10+15 N =25 REC =18"	w=34.3% LL=68 PL=20 *		
TEST B(continued on next page	e								

	hnabal	Project: C	alvert Cliffs	s Nucle	ar Pow	er Plant	Boring Number: B-314				
Schna	bel Engineering	BORING LOG	c	alvert Cou	nty, Ma	ryland		(Contract N Sheet: 4	Number: 06	3120048
DEPTH (FT)	STRATA	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		; А	TESTS	REMARKS
				СН							
92.0 -	SILTY SAND, fir wet, greenish gra shell fragments (moderate.	ie to medium ay, trace fine (5-10%), HC	grained, to medium I reaction	SM	-39.2		 - <u>95</u> -	7+12+15 N =27 REC =18	yu.	∾=36.4% *	
	greenish gray ar	nd white, trac	e fine to				 \[\]	7+9+14		w=31%	
100.0 -	medium shell fra organic matter, h	gments (20-3 HCI reaction	30%), trace strong.		-47.2		X	N =23 REC =18	3"	â	
100.0 -	BOTTOM OF BC	DRING @ 10	0.0 FT.		-47.2		_100-				

Schnal	bel Engineering	TEST Proje ORING LOG	ct: Calvert Calvert	Cliffs Nu County, I	lear Po Marylan	wer Pla d	int		Boring Contra Sheet:	Number: act Number 1 of 4	er: 0612	B-315
Boring C	Contractor: CONNEL	LY AND ASSOC	CIATES, INC.				Gro	undw	ater Obs	ervations		
g -	FREDER	ICK, MARYLANI	D				Da	ate	Time	Depth	Casin	g Caved
Boring F	oreman: D. Bender			En	counter	ed	5/2	22		14.0'		
Drilling I	Method: Mud Rotary											
Drilling E	Equipment: CME-550	X (ATV)										
Schnabe	el Representative: K. E	Bell										
Dates	Started: 5/19/06 Fir	nished: 5/22/06	5									
Location	Easting: 960559.4	3 ft 3 ft										
Ground	Surface Elevation: 65	.5 (feet)										
DEPTH	STRATA D	ESCRIPTION			V		SA	MPL	ING	TEST	9	REMARKS
(FT)				00. (F1) ""	DEP	тн	C	ATA		<u> </u>	KEMARKO
0.8	ROOTMAT AND TO	OPSOIL.		64	7							
0.0 _	POORLY GRADED fine to coarse graine	SAND WITH SI	LT, SP-9	зм оп	`	-	-Mi	1+1+ N =2	1			
-	brown and orangeis	h brown, trace ro	pot			-	-Mi	REC	=12"			
-	trace gravel.					-	-Mi	3+4+ N =8	4			
_	-					_	ιM	REC	=17"			
						6						
							M	4+6+6	B 1			
_					-	ΠQL	REC	- =17"				
-					-							
-					-	-Mi	6+6+ N =13	7	w=5.6	%		
_						-		REC	=14"			
10.0				55	-	10						
10.0	SILTY SAND, fine to	o coarse grained	l, SN	1 33.				0 T 0 T 0	a			
-	brown, trace gravel.	wit and orangels	211			-		N =17	7			
_						-		REC	=16"			
-						-	-				F	Resumed
_	fine to medium grair	ned, wet, gray.			∣⊻	_		4+7+0	6	w=28.3	^{3%} 5	/22/06 at
						15	M	N =13 REC	3 =15"		8	:30am.
2												
-						-	11					
17.0 -	CLAYEY SAND, m	oist, gray, trace	s	48.	5	-	-					
-	sand.		x 209	~~		-	-					
_						_		4+7+	8	w=28.3	3%	
						20	Ŵ	N =15 REC	o =18"			
						-20-						
-						F	1					
-						-	+					
-						-	4					
_						Ļ		REC	=14"	w=23.3	3%	
										PL=1	1	
	continued o	on next page				-25-						
Comment	ts:		I									
1. Boring I	backfilled with cement/k	pentonite grout th	hrough tremie	pipe up	on comp	letion.						
∠. " = See	Appendix I for addition	iai iap testing dat	ta.									

	6	hashal	TEST	EST Project: Calvert Cliffs Nuclear Power Pl					wer Plant Boring Number: B-315				
	Schnat	bel Engineering	ORING LOG	(Calvert Cou	nty, Ma	ryland			Contrac Sheet:	ct Number: 06 2 of 4	6120048	
	DEPTH (FT)	STRATA D	ESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		G TA	TESTS	REMARKS	
		SILTY SAND, fine to wet, gray and white shell fragments (30- moderate.	o medium , trace fine .40%), H0	grained, a to coarse CI reaction	SM	40.5		DEPTH	26+21+2 N =43 REC =1 38+44+4 N =86 REC =1	TA 22 8" 42 4"	PP=>4.5 tsf * w=27.6%		
	- - - 42.0 - - -	fine to coarse graine white, with fine to co fragments (60-70%) strong. SILTY SAND, fine to moist, greenish gray organic matter.	ed, light g barse shel , HCI rea o medium y and gray	ray and l ction grained, ı, trace	SM	- 23.5			3+4+4 N =8 REC =1	16 4" 8"	w=22.2% LL=NP PL=NP *		
LOG SPT 300 & 400.GPJ SCHNABEL.GDT 3/6/08	- - - - 53.5	strong cementation, strong.	HCI reac	tion	ML	12.0		 	50 REC =6	91	w=25.6% □ = NP	Rig chatter at 46.5 ft.	
TEST BORING LOG 06120048 P	-	fine to coarse shell HCI reaction moder continued o	tragments ate. on next pag	e (10-20%),					N =15 REC =1	7"	LL-INP PL=NP *		

	6	hpabol TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number: B-31		
	Schnat	bel Engineering LOG		alvert Cou	nty, Ma	iryland		Co Sh	neet: 3 of 4	6120048
	DEPTH (FT)	STRATA DESCRIP	TION	CLASS.	ELEV. (FT)	WL	S/ DEPTH	AMPLING	TESTS	REMARKS
	-	trace fine to coarse shell fra (35-45%), HCl reaction stro	gments ng .	ML				6+8+8 N =16 REC =16"		Rig chatter at 61 ft.
	63.5 - - - -	POORLY GRADED SAND (greenish gray, trace fine to r shell fragments (5-10%), He weak.	MTH SILT, nedium Cl reaction	SP-SM	2.0			5+5+9 N =14 REC =15"	w=29.4% LL=NP PL=NP *	
	- - - 73 5				-80			4+4+6 N =10 REC =18"		
		SANDY FAT CLAY, trace fir medium shell fragments (20 reaction moderate, green.	ne to -30%), HCI	СН	-11.5		M 	4+5+6 N =11 REC =20"	w=36.3% LL=58 PL=18	
SCHNABEL.GDT 3/6/08		SILTY SAND, fine to coarse wet, light gray and white, tra coarse shell fragments (20-3 HCI reaction, cemented laye 79.9 ft.	grained, ce fine to 30%), strong er from 79' to	SM	-11.0		 	16+41+9 N =50 REC =18"		
.OG SPT 300 & 400.GPJ S		fine to medium grained, greatrace fine to medium shell fr (2-5%), HCl reaction weak.	enish gray, agments		21.5		 	7+10+10 N =20 REC =19"	w=29.6% LL=NP PL=NP *	
DRING LOG 06120048 PL	87.U - - -	SANDY ELASTIC SILT, wet gray and white, trace fine to shell fragments (20-30%), H moderate.	, greenish medium łCl reaction	МН	1-21.5		 	6+7+13 N =20 REC =18"		
TEST BC	_	continued on next pa	ge							

ſ	6	hnabal	TEST	Project: C	alvert Cliffs	s Nucle	ar Pow	er Plant	Boring Number: B-315			
	Schnal	bel Engineering	BORING LOG	c	alvert Cou	nty, Ma	ryland			Contra Sheet:	ct Number: 00	6120048
	DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		G TA	TESTS	REMARKS
Ī					МН							
	92.0 - - - -	SILTY SAND, fir wet, greenish gr shell fragments weak.	ne to medium ay, trace fine (2-5%), HCI	grained, to medium reaction	SM	-26.5		 - <u>95</u> _	5+7+11 N =18 REC =1	8"	w=35.6% *	
	-							 N	7+11+1	2		
	100.0 —	BOTTOM OF BO	ORING @ 10	0.0 FT.		-34.5		/	REC =1	9"		
US												
EL.GUI 3/0/												
FU SCHNAE												
3UU & 4UU.G												
מ דרטם ארו												
10 UB12UU4												
I BURING LI												
E N												

SC	hnabel BORING	Project: (t: Calvert Cliffs Nuclear Power Plant Calvert County, Maryland							Boring Number: Contract Number: 0612 Sheet: 1 of 4		1200	B-316	
Schnat	bel Engineering LOG									Sheet:	1 of 4			
Boring C	contractor: CONNELLY AND	ASSOCIATE	S, INC.					Gro	oundv	vater Obs	ervations			
-	FREDERICK, MAI	RYLAND						D	ate	Time	Depth	Casi	ng	Caved
Boring F	oreman: D. Reese				Enco	untere	d	5	5/4		24.0'		ŝ	
Drilling														
Schnabo														
Dates 9	Started: 5/3/06 Finished: 5	13/06												
Location	Northing: 216767 16 ft	10/00												
Location	Easting: 960864.35 ft											-		
Ground	Surface Elevation: 108.1 (feet)	ĺ.												
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLAS	ss. ^E	ELEV. (FT)	WL		S	AMPL	ING	TEST	s	R	EMARKS
							DEP	TH M	2+2+	ATA 4			Aug	er
0.5	POORLY GRADED SAND		SP-S	sc 1	107.6		Ļ.		N =7	10"			, uy	
	fine to medium grained, mois	st, brown,					_		REC	=18"				
2.5		browp		1	05.6		-		2 ¹ 21	2	w=19.1	%		
	SANDT LEAN CLAT, MOISI,	DIOWII.		-				IXII	N =4	2	LL=35	5		
									REC	=16"	PP=2.00) tsf	char 7/8"	nged to 3 roller bit
_							- 5 -				*			
							L.	IM	2+1+ N =3	2				
								Ш	REC	=11"				
-												· · · ·		
	fine to coarse grained, mois	t, brown.						HMI	2+1+ N =2	1	w=14.5	%		
								إلكا <u>ـ</u>	REC	=10"				
_														
10.5	SILTY SAND fine to medium	arained	SM	<u></u>	97.6				2+3+	2				
	moist, yellowish brown.	r gramea,						IXII	N =5	40"				
-									REC	=12"				
_								+						
3 13.5	POORLY GRADED SAND V	VITH SILT,	SP-S	SM SM	94.6			M	6+8+	8				
5	fine to coarse grained, moist orange	, brownish						Ŵ	N =10 REC	5 =12"				
	orango.						-15-		I L O					
								+						
- b														
2							L .							
18.5	CLAYEY SAND fine to coard	se arained	50		89.6				3+3+	4				
-	moist, orangeish white.	se grained,		´				IXII	N =7	-				
5 –							-20-		REC	=12"				
							L -							
							L.							
23.5					84 6	_					000	,		
20.0	POORLY GRADED SAND V fine to medium grained wet	VITH SILT, orangeish	SP-S	SM		Ā		M	3+4+ N =9	5	W=20%	/0 D		
_	brown, .	2. di igolori					-25-	$ \square $	REC	=15"	PL=N	>		
2	continued on next pag	ge												
· [1											
ſ	Schnabel Engineering DEPTH STRATA DESCRIPTION				alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-316		
--------------------------------	---	---	----------------	------------	--------------	---------------	--------	------------------------	-------------------------	------------------	---	---------------		
	Schna	Schnabel Engineering BORING LOG DEPTH (FT) STRATA DESCRIPTION				nty, Ma	ryland			Contra Sheet:	ct Number: 06	6120048		
	DEPTH (FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH	SAMPLIN	IG TA	TESTS	REMARKS		
	-	-			SP-SM						*			
	-	brownish orange	, 1" clay sea	n				 - <u>-</u> 30	3+5+3 N =8 REC =1	12"		1'' clay seam		
	- - - -							 35 	2+3+3 N =6 REC =1	8"	w=20.1% LL=43 PL=17 *			
	- 38.5 - -	SANDY LEAN C	LAY, moist, o	lark gray.	CL	69.6		 - 40	1+3+2 N =5 REC =1	18"	w=28.5% *			
	- - -	with sand.						 45	REC =2	24"	w=28.6% LL=44 PL=16 PP=2.00 tsf *			
0.GPJ SCHNABEL.GDT 3/6/08	- 48.5 - -	SANDY ELASTI gray, trace sand	C SILT, mois	t, dark	MH	59.6		 50	3+4+4 N =8 REC =1	8"	w=38.0% PP=1.50 tsf *			
LOG 06120048 PLOG SPT 300 & 40	- 53.5 - -	LEAN CLAY, mo sand.	ist, dark gray	r, with	CL	54.6		 55	REC =2	24"	w=26.2% LL=33 PL=11 PP=3.25 tsf *			
TEST BORING	-	continu	ed on next pag	e										

ſ	SC		Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring N	Number:	B-316
	Schnat	bel Engineering LOG			rity, ivia	iyianu			Contrac Sheet: 3	t Number: 06 3 of 4	5120048
	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLIN	IG TA	TESTS	REMARKS
	58.5	CLAYEY SAND, fine to medi grained, moist, dark gray.	um	SC	49.6			5+5+6 N =11 REC =1	8"	w=24.4%	
	-	greenish gray, trace cemente	ed sand.					9+10+1 N =23 REC =1	3	w=31.3% *	changed to 2 15/16" roller bit
	-										Harder drilling
	68.5 - -	SILTY SAND, fine to medium moist, gray, with silt, trace fin medium shell fragments, mod reaction.	a grained, e to derate HCI	SM	39.6		 X	42+50/4 N =50/4 REC =1	4" 1" IO"	w=19.8%	
	-										softer drilling
	73.5 - - -	POORLY GRADED SAND, fi medium grained, moist, gray, to medium shell fragments, tr moderate HCI reaction.	ne to , trace fine race clay,	SP	34.6		⊠ —75— 	50/5.5" N =50/5 REC =6	5.5" 5"	w=21.2% *	
L.GDT 3/6/08		with fine to coarse shell fragr strong HCl reaction.	nents,				 - 80 	50/2" N =50/2	2"		
OG SPT 300 & 400.GPJ SCHNABE	-	with fine to coarse shell fragn strong HCl reaction, 1" ceme frag.	nents, nted sand				 85- 	^I 50/3" N =50/3 REC =1	3" "		Rig chatter
DRING LOG 06120048 PL		trace fine to medium shell fra moderate HCl reaction.	gments,				 ⊠	50/3" N =50/3 REC =1	3"		
TEST BC	-	continued on next pag	<i>je</i>								

	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-316
Schn	abel Engineering LOG	i (Calvert Cou	nty, Ma	ryland		Ī	Contrac Sheet:	ct Number: 06 4 of 4	6120048
DEPTH	STRATA DESCRIPT		CLASS.	ELEV.	WI	5	SAMPLIN	G	TESTS	RFMARKS
(FT)				(FT)		DEPTH	DA	TA	12010	
	_		58							
	_									
93.5	CLAYEY SAND, fine to medi	ium	SC	14.6		17	5+5+7		w=32%	Easier drilling
	with fine to coarse shell frage	nents,				_ ₉₅ _[/	REC =1	8"		· ·
	-									
	-									
	-									
	trace medium to coarse shel	l fragments,				10	6+5+8		w=27.7% *	
100.0				8.1		_ ₁₀₀	REC =1	8"		
		0.011.								
n										
3/0/0										
it GDI										
INABE										
400.61										
a Duc										
2										
8 PLC										
212004										
5										

	test	Project: Cal	lvert Clif	fs Nucle	ar Pow	er Pla	nt		Boring	Number:		B-317
Schna	bel Engineering LOG	Cai		unty, ivia	ryland				Contra Sheet:	ct Number 1 of 4	er: 0612	20048
Boring	Contractor: CONNELLY AND A	ASSOCIATES.	INC.				Gro	oundw	ater Obs	ervations		
g	FREDERICK, MAR	RYLAND					D	ate	Time	Depth	Casin	g Caved
Boring F	Foreman: D. Reese			Start	of day	/	5	5/8		21.0'	4.5'	
Drilling	Method: Mud Rotary											
Drilling	Equipment: CME-75										-	
Schnab	el Representative: M. Arles											
Dates	Started: 5/4/06 Finished: 5/	8/06										
Location	n: Northing: 217094.7 ft Easting: 961249.2 ft											
Ground	Surface Elevation: 94.4 (feet)											
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEP	S/ TH	AMPL C	ING DATA	TEST	s	REMARKS
0.5	ROOTMAT AND TOPSOIL.		SD 50	93.9			M	2+2+2	2		F	Hollow stem Nuger
20 -	POORLY GRADED SAND W trace fine gravel, fine to coars	ITH CLAY, se grained, ragments	3P-30	- 924			W	REC	=12"			
2.0	CLAYEY SAND, fine to coars	e grained.	SC	02.1				1+1+	1			
-	moist, orangeish brown.	o granica,				- '	IXII	N =2				
-								REC	=12"			
4.5	POORLY GRADED SAND, w	ith fine	SP	89.9		- 5 -						
	moist, orangeish brown.	ined,					IM	1+2+3 N =5	3			
						[]	ןעך	REC	=12"			
7.0 -	POORLY GRADED SAND W	ITH SILT,	SP-SM	87.4								
-	trace gravel, fine to coarse gr	ained,					HM	2+5+	7			
	molat, brownian orange.					Ļ.	M	REC	=14"			
9.5	CLAVEY SAND with siltfine t	o coarse	SC	84.9								
	grained, moist, brownish oran	ige.	00			-10- 	1_					
-	-						HMI	4+5+0 N =11	6 			
-	-					L .		REC	=12"			
12.5	POORLY GRADED SAND W	ITH SILT.	SP-SM	81.9								
3	fine to medium grained, moist	t, brownish				Г ^с						
5 - 5	lorange.						1					
- 100	-					-15-	+					
	-					Ļ.						
- 0	-					F .	1					
-							-					
5 -	fine to coarse grained, orange	e.				L .	-M	6+7+	7			
-						20	Ŵ	N =14 REC	1 =12"		1	" clav laver
						– 20–					É	Finer sand
	-					F .						
22.0 -	SANDY SILT fine to medium	moist	м	72.4			+					
	orange.	, 110101,				L,						
								2+2+2	3	w=28.4	%	
24.5			~ .	69.9		Γ.	╢╢	N =5	- 10"	PP=1.25	tsf	
- 2	SANDY LEAN CLAY, fine to r continued on next page	medium,	CL			-25-		KEC	=18"			
3	pug	NM										

ſ	6	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-317
	Schnat	Del Engineering LOG	alvert Cou	nty, Ma	ryland		Contract Number: 0 Sheet: 2 of 4	6120048
	DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPLII DEPTH DA	NG TESTS	REMARKS
ľ		moist, gray.	CL				PP=1.5, 1.2 tsf	
	-	dark gray.				 REC =	24" w=31.7% LL=27 PL=19	lean clay
	 32.0 -	SANDY FAT CLAY, fine to medium, moist, dark gray, Pockets of more/less	СН	· 62.4			PP=2.25 tsf *	
	-	sand.				2+3+3 35 2+3+3 N =6 REC =	w=30.2% PP=1.25,1.0 18" tsf *	
	-	dark gray, trace sand.				 ■ REC = 40 	24" PP=3.50 tsf	
	-	gray.				 45 	PP=3.5,3.75 tsf 18"	
PJ SCHNABEL.GDT 3/6/08	47.0 - - -	SANDY LEAN CLAY, fine to medium grained, moist, grayish green.	CL	47.4		 	22" w=22.8% LL=35 PL=17 *	
048 PLOG SPT 300 & 400.G	51.0 - - -	POORLY GRADED SAND WITH SILT, contains cemented sand, fine to medium grained, moist, dark brownish orange.	SP-SM	43.4		 N =50/4" N =50/ REC =	4" 1"	
ST BORING LOG 0612(-	continued on next page						2 15/16" OD roller bit
끹								

ſ		TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Во	oring Number:	B-317
	Schna	bel Engineering LOG	C C	alvert Cou	nty, Ma	ryland		Co	ntract Number: 0 eet: 3 of 4	6120048
	DEPTH (FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	S. DEPTH	AMPLING	TESTS	REMARKS
		light orangeish brown.		SP-SM			<u>-</u>	16+12+50/- N =62/10" REC =14"	4" w=26% *	
	61.0 ·	CLAYEY SAND, fine to med grained, moist, gray.	ium	SC	33.4		 			
	-						X 65 	28+50/4" N =50/4" REC =5"		
	- -	trace shell fragments, conta cemented sand, shell frag fir size, moderate HCI reaction.	ins le to coarse				 ⊠ 70 	5+50/1" N =50/1" REC =4"		Harder drilling
	- - -	wet, greenish white, with fine shell fragments, strong HCl i	e to coarse eaction.				 - 75 	8+50/5" N =50/5" REC =11"	w=22.3%	
EL.GDT 3/6/08	77.0 - - - -	SILTY SAND, fine to mediur moist, green, 15% medium t shell frag, strong HCI reactio	n grained, o coarse n.	SM	• 17.4		 - 80- 	4+6+7 N =13 REC =18"		
G SPT 300 & 400.GPJ SCHNAB	- - -	contains cemented sand, 25 to coarse shell frag, strong F	% medium ICI reaction.				 	9+10+13 N =23 REC =18"		
RING LOG 06120048 PLC	87.0 ·	POORLY GRADED SAND V fine to medium grained, mois trace shell fragments, 5% f-r	VITH SILT, st, green, n shell frag.	SP-SM	7.4		 	5+6+8 N =14 REC =18"		
FEST BO.	-	continued on next pa	ge							

	Schnabel Engineering TEST BORING LOG Project: Calvert Cliffs Calvert Count				s Nucle	ar Pow	er Plant		Boring	Number:	B-317
Schnal	bel Engineering	C	alvert Cou	nty, Ma	ryland			Contra Sheet:	ct Number: 06	6120048	
DEDTH					FLEV				IG	4 01 4	
(FT)	STRATA DES	CRIPTI	ON	CLASS.	(FT)	WL	DEPTH	DA	TA	TESTS	REMARKS
				SP-SM							
-											
-								_			
-							[3+5+5 N =10			
_							_ ₉₅ _[/	REC =	18"		
_	20.20% modium to oos	araa aha	oll from					10,11,2			
-	moderate HCI reaction	lise she	en nay,)	N =31	.0		
100.0 —	BOTTOM OF BORING	6@100).0 FT.		-5.6		-100-14	I REC =	18"		
00											
ב פ נ											
19.0 0											
0 20											
140 1											
01201											
000											
ND4											
2											

Schn	TEST Project: C BORING BORING C abel Engineering LOG	alvert (alvert (Cliffs Cour	s Nucle nty, Ma	ar Pow ryland	er Pla	nt		Boring Contra Sheet:	Number: Inct Number 1 of 7	er: 0612	B-318
Boring	Contractor: UNI-TECH DRILLING						Gro	oundw	ater Obs	ervations		
	MALAGA, NEW JERSEY						D	ate	Time	Depth	Casing	g Caved
Boring Drilling	Foreman: J. Blemings Method: Mud Rotary			Enco	untere	d	e	/2		20.0'	0.0'	
Drilling	Equipment: CME-750 (ATV)			Start	of day	/	6	5/3		0.0'	0.0'	
Schnal	Stated: 6/2/06 Einichad: 6/5/06			Start	of day	/	6	6/4		31.0'	0.0'	
Locatio	on: Northing: 217019.3 ft			Start	of day	/	6	\$/5		31.0'	0.0'	
	Easting: 961227.2 ft			Start	of da	/	e	6/5		28.0'	0.0'	
Ground	I Surface Elevation: 97.8 (feet)											
DEPTH (FT)	STRATA DESCRIPTION	CLAS	SS .	ELEV. (FT)	WL	DEP	S/ TH	AMPL C	ING ATA	TEST	s	REMARKS
0.5	CRUSHED STONE.			97.3			Μ	5+5+8	3			
20	POORLY GRADED SAND WITH CLAY, fine to coarse grained, dry, brown.	5P-8	SC	05.9		È.	W	REC	s =15"			
2.0	POORLY GRADED SAND, fine to coarse grained, moist, orange, trace	SP	1	90.0				5+6+	5			
	gravel.						W	N =11 REC	=15"			
						[_ `			un 362			
	yellowish orange					[³⁻	M	5+5+5 N =10	5			
7.0				00.0		[שך	REC	=12"			
7.0	POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, vellowish	SP-S	SМ	90.8		[`	$\overline{\mathbf{M}}$	4+6+6	5			
	orange.						M	N =12 REC	2 =12"			
									(contrast)			
	with gravel, 1/8" orange layers with							5+7+8	3			
	more silt.						M	N =15 REC	5 =16"			
	_											
0	_							11+18	3+7			
5						-15-	Ň	N =25 REC	5 =14"			
Ĩ												
18.0				79 8		L.						
.0.0	FINE TO COARSE SANDY SILT, wet, orange.	ML		. 0.0				5+6+	7			
-					⊻	20-	Ň	N =13 REC	} =12"			
	_											
	_					L.						
100						L.						
	moist, mottled orange and gray.					L.		2+1+	1			
-						-25-	Ň	N =2 REC	=18"			
	continued on next page											

	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	в	oring Number:	B-318
Schna	bel Engineering LOG		Calvert Cou	nty, Ma	aryland		C S	contract Number: 0 heet: 2 of 7	6120048
DEPTH (FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLING	TESTS	REMARKS
			ML						
27.0 -	FINE TO MEDIUM SANDY L CLAY, moist, dark gray.	.EAN	CL	70.8					
.	-					M	2+2+3 N =5		
-	-								
- 33.0 -	-	A004 8		64.8					
-	FAT CLAY, moist, dark gray. -	with sand.	СН			M	3+4+4 N =8 REC =18'		
-						-35-0			
	-								
	-					1	4+4+4 N =8 REC =18'		
-	-								
	3" Clayey sand layer					[]	4+8+9 N =17 REC =18'		
-	-								
- אַמּ - פרו אַמ	-								
	-					<u>-</u>	7+8+12 N =20 REC =18'	,	50' Start of day
8 400.GFJ									6/3
53.0 -	CLAYEY SAND, fine to med	um	SC	44.8					
	grained, moist, dark gray. Cemented sand lenses 55-5	3'				<u>-</u> M	5+8+9 N =17 REC =18'		
				40.9					
	POORLY GRADED SAND, f medium grained, moist, redd <i>continued on next pa</i>	ine to ish orange, ^{ge}	SP	40.8					

Schnabel Engineering TEST BORING LOG Project: Calvert Cliffs Nu Calvert County,						ar Pow	er Plant		Boring N	lumber:	B-318
	Schna	bel Engineering LOG	Ca	alvert Cou	nty, Ma	ryland			Contract	t Number: 06	6120048
	DEDTH				EL EV		s		G	5 01 7	
	(FT)	STRATA DESCRIPTI	ON	CLASS.	(FT)	WL	DEPTH	DA	ТА	TESTS	REMARKS
		1/4" red lenses.		SP			X	50/01			
		-						50/2" N =50/2	r i		
							-60-	REC =2	"		
		-									
	62.0				24.0						
	03.0	POORLY GRADED SAND WI	TH SILT,	SP-SM	34.0			50/2"			
		inte to meanan grainea, molor,	gray.					N =50/2			
	-						-65-		5		
		-									
	67.0	POORLY GRADED SAND fin	e to	SP	30.8						
		medium grained, moist, gray,	1/8" and	01							
		sitialier clay lerises.						50/5"			
	_						_70_	N =50/5 REC =5			
	73.0	CLAYEY SAND, fine to mediu	m	SC	24.8						
	,	grained, moist, gray, with silt, cemented sand, 80% cemented	contains ed sand.					50/3" N =50/3			
	-						-75-	REC =2	"		
		-									
	77.0				20.8						
		SILTY SAND, fine to medium moist, green and white, with fi	grained, ne to	SM							
		coarse shell fragments, strong reaction, 60-70% shell frag.	HCI				Π	15+8+1	5		
/08	,							N =23 RFC =1	8"		
T 3/6	_						-80				
EL.GD	,										
HNABE		-									
J SCF		-									
0.GP,		green, 15-25% shell frag.					17	5+8+12			
0 & 4C	_	4					_ ₈₅ _[]	REC =1	8"		
PT 30(
OG SI	07.0				10.0						
148 PL	07.0	POORLY GRADED SAND WI	TH SILT,	SP-SM	10.8						
6120C		strong HCI reaction, 15-20% s	hell frag.					7.14.4			
0 00		1					X	N =27			
ING L	-	1					_90_L	REC =1	8"		
BOR		continued on next name									
TEST		l l l l l l l l l l l l l l l l l l l									

		TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-318
	Schna	bel Engineering LOG	alvert Cou	nty, Ma	iryland		Contract Number: 0 Sheet: 4 of 7	6120048
Ī	DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPLIN DEPTH DA	NG TESTS	REMARKS
		trace fine to coarse shell fragments, moderate HCI reaction, 5-10% shell frag.	SP-SM			 	12 18"	
	97.0	SILTY SAND, fine to medium grained, moist, green, trace fine to medium shell fragments, moderate HCI reaction, 0-5% shell frag.	SM	0.8		 - - - - - - - - - - - -	1 18"	
	-	green and white, with fine to coarse shell fragments, strong HCl reaction, 75-80% shell frag.				 	+33 18"	104' thicker shell beds
œ	-107.0 -	POORLY GRADED SAND WITH SILT, with fine to coarse shell fragments, , fine to medium grained, moist, green, strong HCI reaction, 50-60% shell frag.	SP-SM	-9.2		 	+30 18"	
.GPJ SCHNABEL.GDT 3/6/C	-	25-35% shell frag.		-19.2		 	19 18"	
G LOG 06120048 PLOG SPT 300 & 400.		SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 10-20% shell frag.	SM	, - 1 <i>3.</i> ∠		 	14 18"	
TEST BORIN		trace fine to coarse shell fragments, continued on next page				6+10+^	13	

ſ	6	TEST	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-318
	Schnat	bel Engineering LOG	Ca	alvert Cou	nty, Ma	ryland			Contra Sheet:	ot Number: 0 5 of 7	6120048
ľ	DEPTH			CI 499	ELEV.	34/1	;	SAMPLIN	IG	тсете	DEMADKS
	(FT)	STRATA DESCRIPT		CLASS.	(FT)	VVL	DEPTH		TA	12313	REIMARNO
	_	moderate HCl reaction, 0-5%	shell frag.	SM			125	N =23 REC =	18"		
							120				
	_										
	_							10.44.	10		
	-)	N =23	12		
	_						-130-14	I REC =	18"		
	-										
	-										
	-										
	-	with fine to coarse shell fragm	nents,					8+10+	12		
	_	strong hor reaction, 10-20 %	shell frag.				_ ₁₃₅ _/	REC =	18"		
	_										
	_										
	_										
		45-55% shell frag.						10+17-	+15		
	1.000	5						N =32 REC =	18"		
	_										
	-										
	-										
	-							1			
	_	weak HCl reaction, 0-5% she	gments, Il frag.				1)	N =17) 		
80	_						-145-L	I REC =	18"		
3/6/0	-										
L.GDT	-										
NABE	-										Shelby tube
SCH	-	contains shell fragments.						REC =	3"		pushed
00.GPU							-150-				150' Start of
0 & 4C	-										uay 0/4
SPT 30	_										
S DOJ	_										
0048 P								6+8+10	ט		
06120	_						_155_	N =18 REC =	18"		
LOG							135				
ORING							- 1				
EST BC		continued on next pag	<i>j</i> e				- 1				
۳L								1		l	

BORING Schnabel Engineering BORING LOG Calvert County, Maryland Contract Numi Sheet: 6 of 7 DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH TES 157.0 FINE TO MEDIUM SANDY SILT, moist, green, trace fine to medium shell fragments, weak HCI reaction, 0-5% ML -59.2 - - -	er: 06120048
DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH TES 157.0 FINE TO MEDIUM SANDY SILT, moist, green, trace fine to medium shell fragments, weak HCI reaction, 0-5% ML -59.2 -	S REMARKS
OFF STRATA DESCRIPTION CLASS. CLASS. CLASS. WL DEPTH DATA 157.0 FINE TO MEDIUM SANDY SILT, moist, green, trace fine to medium shell fragments, weak HCI reaction, 0-5% ML -59.2	S REMARKS
157.0 FINE TO MEDIUM SANDY SILT, moist, green, trace fine to medium shell fragments, weak HCI reaction, 0-5% ML -59.2	
fragments, weak HCI reaction, 0-5%	
$-\frac{1}{10000000000000000000000000000000000$	
_ sand.	
170 X N =19 REC =18"	
with clay.	
moist, green, with clay.	
8	
89.2 +	
continued on next page	

	hnabel TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Numb	oer:	B-318
Schnal	bel Engineering LOG	G	Calvert County, Maryland					Contract Nur Sheet: 7 of	nber: 0 7	6120048
DEPTH	STRATA DESCRI		CLASS	ELEV.	WL	;	SAMPLIN	G TE	STS	REMARKS
(FT)		non	CLAUD.	(FT)	VVL	DEPTH	DA			REMARKO
_			МН							
_										
-										
-	oliveish green, trace sand.)	N =22			
						- <u>195</u>	J REC =1	18"		
-										
-										
-										
_	with sand.					[5+6+9			
200.0 —			_	-102.2		/	REC =1	8"		
	BOTTOM OF BORING @	200.0 FT.								
200										
5										
8										
5										
1 0 0										
8										
2										

Schnal	hnabel BORING	Project: Ca	alvert (alvert (Cliffs Nuc County, N	lear Pov Iarylanc	ver Pla	nt		Boring Contra	Number: ct Numbe	er: 06120	B-319
ocima	LOO						6.	hund	vater Obc	ervations		
Boring C	Contractor: UNI-TECH DRILLI						חט ח	ato	Time	Denth	Casing	Caved
Boring F	Foreman: J. Blemings		ľ	Enc	ounter	ed	5	5/5		10.5'		
Drilling I	Method: Mud Rotary		ľ	Sta	rt of da	v	5	5/8		26.0'		
Drilling I	Equipment: CME-750 (ATV)		ŀ			2						
Schnabe	el Representative: K. Megginso	'n										
Dates	Started: 5/5/06 Finished: 5	/8/06										
Location	1: Northing: 216963.62 ft Easting: 961123.01 ft											
Ground	Surface Elevation: 102.9 (feet)	<u>í</u>										
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLAS	SS. ELE	/. wL	DEP	S/ TH	AMPL C	ING DATA	TEST	S F	REMARKS
0.3	ROOTMAT AND TOPSOIL.		SP-S	M 102.	6		M	3+4+	2			
_	POORLY GRADED SAND W fine to coarse grained, moist, contains clayey sand pockets	VITH SILT, , brown, s.				-	-M -	N =6 REC	=12"			
-							8	3+3+ N =7 REC	4 =10"	w=5.7° *	%	
5.0 —	POORLY GRADED SAND, v	vet, brown	SP	, 97.9		- 5 -	M	4+6+	6			
-							-M -	REC	=11"			
-							8	5+5+ N =13 REC	8 3 =11"	w=4.7° LL=NF PL=NI *	% > >	
10.0 —			SD S	92.9		-10-	-					
-	light yellowish brown and ligh	nt grayish			<u> </u>		-0	6+6+ N =1: REC	7 3 =10"			
						- - 15-	-	5+5+ N =1: REC	7 2 =10"	w=7.6° *	%	
							-					
- − − − − − − − − − − − − − − − − − − −	orangeish brown, trace fine g	ŋravel.				- 	-8	8+9+ N =1 REC	8 7 =7"			
				70.4			- - -					
23.5 	CLAYEY SAND, trace gravel brown, contains clayey sand	l, yellowish lenses	SC	78.1		- 25-	-0	5+3+ N =5 REC	2 =15"	w=19.8 *	%	
	continued on next pag	ge										

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-319
Schnal	bel Engineering LOG	Calvert Cou	inty, Ma	ryland		Contract Number: 0 Sheet: 2 of 4	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPLII DEPTH DA	NG TESTS	REMARKS
-	SANDY FAT CLAY, fine to medium, wet, light gray and dark brown.	СН					
27.0 -	CLAYEY SAND, fine to medium grained, wet, mottled yellowish brown and light gray (high percentage of	SC	75.9				
- 29.5 —	fines). SANDY LEAN CLAY, fine to medium,	CL	73.4		W WOH/ N = W REC =	18" w=24.5% OH/18" 18"	
-	wet, gray, trace filica.						
-					REC =	24" w=29.2% LL=49 PL=12 PP=2.75 tsf	*Shelby tube sampler push from 33.5 to 35.5 ft.
37.0 -	FAT CLAY, moist, gray, trace sand, and mica.	СН	65.9				
-					WOH+ N =8 REC =	-3+5 w=27.9% *	
-							
-					 REC =	20" w=32.1% LL=58 PL=13 PP=3.25 tsf	*Shelby tube sampler push from 43.5 to 45.2 ft.
	light gray.					w=38.6% LL=79 18" PL=27 *	
							*Shelby tube
						4" PP=4.25 tsf	sampler push from 53.5 to 54.3 ft.
	FINE TO MEDIUM SILT with cand	MI	45.9				
	moist, gray and dark greenish gray, continued on next page						

Comments:

	test	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	B	Boring Number:	B-319
Schna	bel Engineering LOG		Calvert Cou	nty, Ma	iryland		C S	Contract Number: Sheet: 3 of 4	06120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLING	A TESTS	REMARKS
-	trace mica, contains indurate pockets.	d lean clay	ML			 	7+10+17 N =27 REC =18'	w=26.7% LL=40 PL=32	
62.0 - - - -	SILTY SAND, fine to medium moist, brown.	ı grained,	SM	40.9		 ⊠ 65 	50/5" N =50/5" REC =1"		
	gray, trace mica.					 70 	50/4" N =50/4" REC =1"		
	wet, gray and light gray, mos coarse shell fragments (±809 HCl reaction, (shell fragment inch in size).	tly fine to 6), strong s up to 1/2				 	31+36+5(N =86/9" REC =13'	0/3" w=17.5% "	**Resumed drilling at 8:30 AM on 5/8/06.
	light gray, mostly strongly ce sand (±>90%), weak HCl rea	mented ction.				 ⊠ 80 	50/5" N =50/5" REC =1"		10%-144-
	light oliveish gray and light gr fine to coarse shell fragment moderate HCI reaction, stron cementation.	ay, few s (±10%), g				 85-	32+43+5(N =93/9" REC =11'	0/3" w=18.2% "	*Moderately difficult drilling below 85 ft.
	continued on next pag	<i>je</i>				 	6+6+9 N =15 REC =18'	w=29.8% PP=0.25 tsf *	

001010

	hnabel	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-319
Schnal	bel Engineering	LOG		alvert Cou	nty, Ma	ryland			Contrac Sheet:	ct Number: 06 4 of 4	6120048
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S		G	TESTS	REMARKS
				SM							
-								6.7.11			
-							X	N =18	18"		
_							_95_ _ _				
-											
	moderate HCI r	eaction.									
								6+7+11		w=30%	
100.0 —					2.9		_ ₁₀₀ Ň	N =18 REC =1	18"	PL=NP *	
	BOTTOM OF B	ORING @ 10	0.0 FT.								
3											
5											
8 0 1 0											
2											

Schnal	TEST Project: C. bool BORING C. bool LOG	alvert Cl alvert Co	liffs Nucle ounty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra	Number: Inct Number	er: 06120	B-320
ocima						Cround	votor Obc	orvetions		
Boring C	CONNELLY AND ASSOCIATES	, INC.)	Date	Time	Denth	Casing	Caved
Boring F	oreman: D. Reese		Enco	untere	d	5/8		28.0'	3.5'	
Drilling I	Method: Mud Rotary		Start	of day	/	5/9		11.3'	3.5'	
Drilling I	Equipment: CME-75 (Truck)	F								
Dates	Representative: M. Aries	-								
	• Northing: 216943.5 ft									
Looution	Easting: 961044.1 ft									
Ground	Surface Elevation: 106.4 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLASS	s. ELEV. (FT)	WL	DEP	SAMPI	LING DATA	TEST	S F	REMARKS
0.5	ROOTMAT AND TOPSOIL.	05.01	105.9			M 1+2+	-2			
-	POORLY GRADED SAND WITH SILT, fine to medium grained, moist, brown, contains root fragments.	SP-SN	Λ				=18"			
-	no observable root fragments.				-	- 2+3+ N =6 REC	-3 =18"	w=10.4 *	ł%	
4.5	CLAVEY SAND fine to coarse grained	<u>sc</u>	101.9				21 994			
-	moist, brownish orange, with fine gravel.				- 5-	3+3+	-5 =16"			
7.0 -			99.4			-	10			
-	coarse grained, moist, brownish orange.	J				- 0 5+6+ N =1 REC	-7 3 =13"	w=6.3'	%	
-	with gravel.					- - - - - - - - - - - - - - - - - - -	-8 5 =14"			
	reddish orange.				- - 15-	- - - - - - - - - - - - - - - - - - -	-7 5 =12"			
	orange.				- - 20- -	- - - - - - - -	2+10 2 =14"	w=9.1	%	
	orangeish white.				- - 25-	- 	l+11 5 =15"			
	continued on next page									

	hnabol TEST	Project: C	Calvert Cliff	s Nucle	ar Pow	er Plant	В	oring Number:	B-320	
Schnal	bel Engineering LOG		Calvert Cou	nty, Ma	iryland		Contract Number: 06120048 Sheet: 2 of 5			
DEPTH (FT)	STRATA DESCRIP	FION	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLING	TESTS	REMARKS	
			SP							
27.0				70.4						
27.0 -	POORLY GRADED SAND V fine to coarse grained, wet, o	VITH SILT, prange.	SP-SM	/9.4	V					
_					-	L IM	7+5+4			
29.5	SILTY SAND, fine to mediur	n grained,	SM	76.9		_ ₃₀ _Ŭ	N =9 REC =18"			
	wet, orange.									
32.0 -	CLAYEY SAND. moist. dark	grav.	SC	74.4						
	,,,,	3						00.4%		
						M	WOH+1+2 N =3	2 W=26.1% LL=33 PL=18		
-						_ ₃₅ _ U		*		
-										
_	with sand.						REC =24"	w=29.4%		
-						-40-		PL=16 PP=1.50 tsf		
-								*		
42.0 -	SANDY FAT CLAY, moist, d	ark grav.	СН	64.4						
-	with sand.							w=200/		
-						F -1M	2+2+3 N =5 PEC =18"	LL=56 PL=19		
-						-45-1		*		
0/08										
- 301 3/	fine to medium grained, mois gray.	st, dark								
- HABELI							REC =18"	w=34.4% LL=59		
– sch						-50-		PL=19 *		
- 300 &	trace sand.									
- DG SPT							5+6+7	w=34.9%		
- 048 PLC							N =13 REC =18"	LL=69 PL=24		
06120								*		
ຍ 57.0 -		a 24		49.4						
BORIN -	SILTY SAND, fine to mediur moist, greenish gray.	n grained,	SM							
TEST	continued on next pa	ye								

Comments: 1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion. 2. * = See Appendix I for additional lab testing data.

	TEST Pr	oject: Calv	vert Cliffs	Nuclea	ar Pow	er Plant	E	Boring Number:	B-320
Schna	bel Engineering LOG	Calv	vert Cou	nty, Ma	ryland		0	Contract Number: 00 Sheet: 3 of 5	6120048
DEPTH (FT)	STRATA DESCRIPTION	N (CLASS.	ELEV. (FT)	WL	S		G TESTS	REMARKS
			SM				5+7+7		
-						X	N =14 REC =18	<u>ju.</u>	
						-60			
62.0									
62.0 -	POORLY GRADED SAND WITH fine to medium grained, moist, re gray,contains snail shell fragmen	l SILT, s eddish nts.	SP-SM	44.4			10.04.0		
64.0 - 64.5	POORLY GRADED SAND, fine t	to	SP	42.4 41.9		X	N =44		
-	trace silt, 10% fine to medium sh fragments.		SP-SM			65 [] 			
67.0 -	with silt.	i gray,	SM	39.4					
_	SILTY SAND, fine to medium gra moist, brownish yellow.	ained,					50/3"		
						-70-	REC =2"		
-									
-									
-	grayish green, contains cemente	d sand,					35+50/2"	w=18.8%	
_	HCI+.	jments,				-75-	REC =8"		
-									
-									
-	5% fine to medium shell fragmen	nts.					50/2"		
- 2009						-80-	N =50/2" REC =2"		
- 601									
- HNABE									
- so							50/1"		
× 400.0							N =50/1" REC =0"		
907 87.0 -	CLAYFY SAND fine to medium		SC	19.4					
- 120048	grained, moist, gray, 50% cemer sand.	nted							
- 90 - 90						-	' 50/2" N =50/2" REC =0"		
						-90-	REC =0		
	continued on next page								

	6	hnahal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Bo	oring N	Number:	B-320
	Schnal		BORING LOG	c c	alvert Cou	nty, Ma	iryland			Co	ontrac	t Number: 00	6120048
									SA				
	(FT)	STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTI	H	DATA		TESTS	REMARKS
					SC								
	92.0 -	SILTY SAND, fir	ne to medium	grained,	SM	14.4							
	-	moist, green, tra to coarse shell f	ice silt, with 1 ragments, HC	0-20% fine XI+.									
	-								M	7+10+12 N =22		w=25.4% *	
	_							_95_	Δ	REC =18"			
	_												
	_												
	1000	fine to medium (rained							6+6+9			
	_	ine to median g	graineu.						XII	N =15			
								100-		REC - 10			
	-												
	-	fine to medium	arained mois	st dark									
	_	green, with silt.	9	.,									
								1	∇	3+5+5		w=29.2%	
	_							-105-	Δ	N =10 REC =18"			
	_												
	_												
	-												
	-								XII	4+5+5 N =10			
	_	20-30% fine to a	oarse shell fr	agments,				-110-		REC =18"			
	_	TICI+ below 103											
	112.0 -		NAV fine to	modium		-5.6							
16/08	_	grained, wet, da	rk green and	white,									
SDT 3	_	contains cement	gments, HCl+	35% tine to					∇	20+18+14		w=28.5%	
BEL.0								115	Å	N =32 REC =18"		PL=16	
CHNA								113				~	
s Lds	-							- 1					
400.G	-							- 1					
300 &	-												
SPT	110 5	20-30% fine to c	coarse shell fr	agments.		121			M	10+14+14 N =28			
PLOG	.19.0	SILTY SAND, fir	ne to medium	grained, to medium	SM	-13.1		-120-	Δ	REC =18"			
20048	-	shell fragments.	, e e /o mie i					╞╶┤					
061	-							╞╶┧					
9 L O G	_												
ORIN	_								R	5+7+12			
EST B		continu	ied on next pag	e									

							entro en en sin				Boring	Number:	B-320
	Schnat	pel Engineering	LOG	С	alvert Cou	nty, Ma	iryland				Contra Sheet:	ct Number: 00 5 of 5	6120048
	DEPTH (FT)	STRAT/	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH	SA 1		G FA	TESTS	REMARKS
	124.5	ELASTIC SILT, moist, green, wit coarse shell frag	fine to mediu h silt, 25-35% ments, HCl+	m grained, 6 fine to	MH	-18.1		125 		N =19 REC =18	3"		
	-	dark green.						 -130-		7+8+10 N =18 REC =18	3"	w=34.1% LL=50 PL=30 *	
	132.0 - - -	CLAYEY SAND, grained, moist, d	fine to mediu lark green.	um	SC	-25.6		 	7	7+7+9 N =16			
	-					30.6		135		REC =18	8"		
	- - - -	SILTY SAND, fir moist, dark gree medium shell fra	ne to medium n, 0-10% fine gments.	grained, to	SM	-30.0		 [140[4+6+8 N =14 REC =18	8"		
00/0/0								 -145-4		5+6+6 N =12 REC =18	3"		
J.GPJ SUMNABEL.GDI	- - 150.0 —	10-30% fine to c	oarse shell fr	agments.		-43.6		 -150-		5+7+7 N =14 REC =18	3"	w=37% *	
30KING LUG 10120040 MLUG 2M1 300 & 40		ROTTOM OF BC	лкіні (@ 15	J.U F I.									

Joined: Joine: Joined: Joined: Joine: Joined: Joined: Joined: Joi	School	chnabel TEST BORING	Project: Ca	lvert Clif Ivert Co	ffs Nucle unty, Ma	ar Pow ryland	er Pla	nt		Boring Contra	Number: ct Numbe	e r: 061200	B-321
Boring Contractor: CONNELLY AND ASSOCIATES, INC. FREDERICK, MARYLAND Date of the legith Casing Casing Casen Boring Foreman: D. Bender Date Time Deptition Casen Casen </td <td>Serina</td> <td>LOG</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>6</td> <td>Junde</td> <td>ator Obc</td> <td>orvations</td> <td></td> <td></td>	Serina	LOG						6	Junde	ator Obc	orvations		
Boring Foreman: D. Bender Drilling Method: Mul Rotary Drilling Equipment: CME-550 Schnabel Representative: K. Bell Dates Started: 6/5/06 Finished: 6/6/06 Location: Northing: 217152 5 ft Esting: 960333.2 ftEncountered $6/5$ G $ -$ <th< td=""><td>Boring</td><td>Contractor: CONNELLY AND EREDERICK MA</td><td>ASSOCIATES,</td><td>INC.</td><td></td><td></td><td>1</td><td>חט</td><td>ate </td><td>Time</td><td>Denth</td><td>Casing</td><td>Caved</td></th<>	Boring	Contractor: CONNELLY AND EREDERICK MA	ASSOCIATES,	INC.			1	חט	ate	Time	Denth	Casing	Caved
Drilling Method: Muk Rotary Drilling Equipment: CME-550 Schnabel Representative: K. Beil Dates Started: 0/506 Location: Northing: 217152:5 ft	Boring	Foreman: D. Bender			Enco	untere	d	6	6/5		13.5'		
Drilling Equipment: CME-550 Schnabel Representative: K. Bell Dates State: Dates State: Ground Surface Elevation: 70.7 (feet) Cround Surface Elevation: 70.7 (feet) DEPTH DATA Test State: SAMPLING Depth: Data Test State: SAMPLING Depth: Data Test State: SAMPLING Depth: Data Test State: SAMPLING Test State: Samplifie: Test State: Samplifie: Test State: Samplifie: Test State: Samplifie: Test State: Samplifi:	Drilling	Method: Mud Rotary			Start	of day	/	6	5/6		15.0'		
Schnabel Representative: K. Bell	Drilling	Equipment: CME-550		-									
Dates Started: 65/00 Finished: 56/00 Location: Northing: 217/52.5 ft Image: Started S	Schnab	el Representative: K. Bell											
Location: Northing: 217152.5 ft Easting: 950033.2 ft Cround Surface Elevation: 70.7 (feet) DEPTH (FT) STRATA DESCRIPTION (FT) CLASS. ELEV (FT) WL (FT) SAMPLING DEPTH TESTS REMARKS 0.5 ROOTMAT AND TOPSOIL. CLAYEY SAND, trace gravel, fine to medium graned, moist, orangelish brown, trace wood fragments, trace root fragments. SC 70.2	Dates	Started: 6/5/06 Finished: 6	/6/06										
Ground Surface Elevation: 70.7 (feet) DEPTH STRATA DESCRIPTION CLASS ELEV WL SAMPLING DEPTH DATA 0.5 ROOTMAT AND TOPSOIL. CLASS ELEV WL SAMPLING DEPTH DATA TESTS REMARKS 0.5 ROOTMAT AND TOPSOIL. CLAYEY SAND, trace gravel, fine to medium grained, moist, yellowish brown, trace root fragments, trace root fragments. SC 70.2 1*2*2 3*3*4 W=9.7% 4.5 POORLY GRADED SAND WITH SILT, fine to medium grained, moist, orangeish brown, trace root fragments. SP-SM 66.2 74.7*8 W=7.4% 7.0 SANDY LEAN CLAY, moist, orangeish brown and gray, trace root fragments. CL 63.7 74.7*8 W=25.2% 10.0 SANDY FAT CLAY, moist, orangeish brown and gray. CH 60.7 1*1+2 W=36.2% 11.0 CLAYEY SAND, fine to medium grained, wet, gray. SC 57.7 Image: transmit and tran	Locatio	n: Northing: 217152.5 ft Easting: 960333.2 ft											
DEPTH (FT)STRATA DESCRIPTIONCLASS.ELEV. (FT)WLSAMPLING DEPTHTESTSREMARKS0.5ROOTMAT AND TOPSOIL. CLAYEY SAND, trace gravel, fine to medium grained, mosit, velowish fine to medium grained, mosit, orangeish orangeish forwn, trace root fragments.SC70.2 14.22 N =4 REC =12"4.5POORLY GRADED SAND WITH SILT, fine to medium grained, mosit, orangeish forwn and gray.SP-SM66.2 14.33 N =5 REC =18"w=7.4% W =25.2%7.0SANDY LEAN CLAY, moist, orangeish brown and gray.CL63.7- 14.122 N =4 REC =18"w=25.2% N =4 N =410.0SANDY FAT CLAY, moist, orangeish grained, wet, gray.CH60.7- 14.122 N =4 N =5 REC =18"w=38.2% L =55 P =2013.0CLAVEY SAND, fine to medium grained, wet, gray.SC57.7 \overline{Y} 14.243 N =5 N =15 REC =18"w=30.% N =5 N =5 N =513.0CLAVEY SAND, fine to medium grained, wet, gray.SC57.7 \overline{Y} 14.243 N =5 N =11 N =11 	Ground	Surface Elevation: 70.7 (feet)	T										
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	DEPTH (FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS	ELEV. (FT)	WL	DEP	S/ TH	AMPLI D	NG ATA	TEST	S F	REMARKS
CLAYEY SAND, trace gravel, fine to medium grained, moist, yellowish brown, trace wood fragments, trace root fragments. 4.5 POORLY GRADED SAND WITH SILT, fine to medium grained, moist, orangeish brown, trace root fragments. 7.0 SANDY LEAN CLAY, moist, orangeish brown and gray, trace root fragments. 10.0 SANDY FAT CLAY, moist, orangeish brown and gray. 10.0 CLAYEY SAND, fine to medium grained, wet, gray. 13.0 CLAYEY SAND, fine to medium SC 57.7 $\qquad \qquad \qquad$	0.5	ROOTMAT AND TOPSOIL.		80	70.2				1.0.4	,			
$\begin{array}{c} \begin{array}{c} \begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $	· ·	CLAYEY SAND, trace grave	l, fine to wish	30			- ·	╢╢	N =4	-			
$\begin{array}{c} 4.5 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ $		brown, trace wood fragments	s, trace root						REC :	=12"			
4.5 POORLY GRADED SAND WITH SILT, SP-SM fine to medium grained, moist, orangeish brown, trace root fragments. 7.0 SANDY LEAN CLAY, moist, orangeish brown and gray, trace root fragments. 10.0 SANDY FAT CLAY, moist, orangeish brown and gray. 13.0 CLAYEY SAND, fine to medium grained, wet, gray. CLAYEY SAND, fine to medium fine to medium SC ST.7		Tragments.					L .	-M	3+3+4	1	w=9.79	%	
4.5 POORLY GRADED SAND WITH SILT, fine to medium grained, moist, orangeish brown, trace root fragments. 7.0 SANDY LEAN CLAY, moist, orangeish brown and gray, trace root fragments. 10.0 SANDY FAT CLAY, moist, orangeish brown and gray. 13.0 CLAYEY SAND, fine to medium grained, wet, gray. 60.7 June 400 State 100 Stat							L.	M	N =/ REC:	=17"			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	4.5			CD CM	66.2								
7.0SANDY LEAN CLAY, moist, orangeish brown and gray, trace root fragments.CL63.7N =15 REC =18"w=25.2% $3+2+2$ N =4 REC =18"10.0SANDY FAT CLAY, moist, orangeish brown and gray.CH60.7	-	fine to medium grained, mois	st,	3F-3W			- 5 -	M	7+7+8	3	w=7.49	%	
7.0SANDY LEAN CLAY, moist, orangeish brown and gray, trace root fragments.CL63.7 $=$		orangeish brown, trace root f	fragments.				-	-WI	N =15 REC :	; =18"			
SANDY LEAN CLAY, moist, orangeish brown and gray, trace root fragments. 10.0 SANDY FAT CLAY, moist, orangeish brown and gray. 13.0 CLAYEY SAND, fine to medium grained, wet, gray. CLAYEY SAND, fine to medium grained, wet, gray. Score 57.7 Score 57.7 Sco	7.0			-	63.7			-1-1					
$10.0 \frac{\text{SANDY FAT CLAY, moist, orangeish}}{\text{brown and gray.}} CH = 60.7$ $13.0 \frac{\text{CLAYEY SAND, fine to medium}}{\text{grained, wet, gray.}} SC = 57.7$ $\frac{\nabla}{13.0} \frac{\text{CLAYEY SAND, fine to medium}}{\text{grained, wet, gray.}} SC = 57.7$ $\frac{\nabla}{15} \frac{1123}{15} \frac{11233}{15} \frac{11233}{1$		SANDY LEAN CLAY, moist, brown and gray, trace root fr	orangeish agments.	CL			L.		3+2+2	2	w=25.2	%	
$10.0 \frac{1}{2}$ SANDY FAT CLAY, moist, orangeish brown and gray. $13.0 \frac{1}{2}$ CLAYEY SAND, fine to medium grained, wet, gray. $CLAYEY SAND, fine to medium grained, wet, gray.$ $CLAYEY SAND, fine to medium SC = 57.7$ $\frac{1}{2}$ $\frac{1}{$								IXI	N =4	-19"	*		
10.0 SANDY FAT CLAY, moist, orangeish brown and gray. 13.0 CLAYEY SAND, fine to medium grained, wet, gray. CLAYEY SAND, fine to medium SC 57.7 ∇ 111 $+1+2$ $w=36.2\%$ $LL=55$ $PL=20$ $+12+3$ $w=30\%$ $*$ $h=5$ $REC=18"$ $w=30\%$ $*$ $h=5$ $REC=18"$ $w=30\%$ $*$ $h=5$ $REC=18"$ $w=29.7\%$ $*$ $h=11$ $REC=18$ $w=29.7\%$ $*$ $*$ $h=11$ $REC=18$ $*$ $H=10$ $REC=18$ W $*$ $*$ $H=10$ $REC=18$ W $*$ $*$ $H=10$ $REC=18$ W $*$ $*$ $*$ $H=10$ $REC=18$ W $*$ $*$ $H=10$ $REC=18$ W $*$ $*$ $*$ $*$ $*$ $*$ $*$ $*$ $*$ $*$	· ·	-					- ·		NLO.	-10			
$ \begin{array}{c} $	10.0 -	SANDY FAT CLAY moist o	rangeish	СН	60.7		-10-	-					
$13.0 - \frac{1}{2}$ $(13.0 - \frac{1}{2})$ $(13.0 - \frac{1}{$		brown and gray.	langelon	on			L ,	-M	1+1+2	2	w=36.2	%	
$13.0 - \frac{13.0}{\text{grained, wet, gray.}} = \frac{13.0}{\text{gray.}} = 13.$							L.	M	N =3 REC	=18"	PL=20	ó	
$ \begin{array}{c c} 13.0 \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$													
$ \begin{bmatrix} -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1$	13.0	CLAYEY SAND, fine to med	ium	SC	57.7	$\overline{\Delta}$	È '	1_			w-200	4	
$ \begin{array}{c} - & -15 \\ - & -16 $	0 0 0 0	_ grained, wet, gray.						-M	1+2+3 N =5	3	w-307	0	
	- 100	_					-15-	$ \Omega $	REC	=18"			
							L						
$ \begin{array}{c} $													
	ň,	-					- ·	1					
- - <td>5.0</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>- </td> <td></td> <td></td> <td></td> <td></td> <td></td>	5.0	-						-					
$ - \frac{1}{20} - \frac{1}{2$	ž						L .	-M	2+4+7	7	w=29.7	%	
	-							Ŵ	N =11 REC :	=18"	~~		
							²⁰⁻	 "					
		4					- ·	+					
		4						-					
	100						L.						
23.5 LEAN CLAY moist grav	23.5	I FAN CLAY moist grav		CL	47.2				REC	=18"	w=26.2	%	
	PNIK .								NEO.	10	LL=45 PI =19		
continued on next page	- 2 2	continued on next pa	ge				-25-				1° L = 10		

		test	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-321
	Schna	bel Engineering LOG	Ca	alvert Cou	nty, Ma	ryland			Contra Sheet:	ct Number: 06 2 of 5	6120048
	DEPTH (FT)	STRATA DESCRIPTI	ON	CLASS.	ELEV. (FT)	WL	S DEPTH	SAMPLIN	G TA	TESTS	REMARKS
				CL						PP=3.50 tsf	
					12.7						
	27.0	SILTY SAND, wet, gray.		SM	43.7						
							17	3+4+7		w=27%	
	_						_ ₃₀ _Å	N =11 REC =1	8"	PL=29	
	33.0 ·	POORLY GRADED SAND WI	TH SILT,	SP-SM	37.7					00.000	
		fine to coarse grained, wet, grace commentation, platty structure.	ay, strong				X	39+50/3 N =50/3	3" '	w=30.9% *	
	-						-35-	REC =1	0		
		white, with fine to coarse shell	L.				17	15+17+	31	w=27.1%	
	-	fragments, 50-60%, HCI reac strong.	tion				_ ₄₀ Å	N =48 REC =1	6"		
										w-26%	
							10	9+9+7 N =16	o"	w-20% *	
	_						-45- [0		
3/08	47.0				23.7						
3DT 3/		ELASTIC SILT with sand , gra fine to medium shell fragments	iy, trace s, 2-5%,	MH	20.7						
ABEL.(HCI reaction weak					10	4+4 N = 4		w=35.1% *	
J SCHN	_						-50-	y IN -4			
400.GP.											
300 & 4	52.0 ·	SILTY SAND, fine to medium	grained,	SM	18.7						
DG SPT		contains fine to coarse shell fr 20-30% HCI reaction strong	ray, agments, weak					30+11+	10	w=25%	
048 PLC		cementation.	wear					N =21 REC =1	8"	LL=NP PL=NP	
06120(-									*	
G LOG											
BORIN		gray, trace fine to coarse shell	greenish								
TEST		commued on next page	2								

	-	hnabel TEST	Project: Ca	alvert Cliff	s Nuclea	ar Pow	er Plant	E	Boring Number:	B-321
	Schnat	BORING	C:	alvert Cou	nty, Ma	ryland		C	Contract Number: 0	6120048
ł	DEDTH						S			
	(FT)	STRATA DESCRIPT	TION	CLASS.	(FT)	WL	DEPTH	DAT	A TESTS	REMARKS
ľ		fragments, 5-10%, HCI reac	tion	SM				4.4.0	w=27.4%	
	-	moderate.					X	4+4+6 N =10	*	
							_ ₆₀ _[/]	REC =18		
	_									
	_									
		aray and white trace fine to	naree					8+9+1/	w=27.6%	
	-	shell fragments, 20-30%, HC	Cl reaction				X	N =23	*	
	-	strong, strong cementation.					-65-L	REC =18		
	-									
	_									
	_									
		trace fine to medium shell fra	aments.					4+7+9	w=28.4%	
	-	2-5%, HCl reaction weak.	J,				- 1XI	N =16	" *	
	_						_70_			
	-									
	-									
	_									
	_							REC =24	w=28.5%	
							76		PL=NP	
	_						- <i>1</i> 5-		PP=3.75 tsf	
	-									
	-									
	_									
	_						M	4+6+12	w=34.9%	
3/08							_ ₈₀ Ň	N =18 REC =18		
DT 3/							00			
EL.GI	-									
HNAB	-	fine to medium grained, wet	light gray							
L SC	-	and white, contains fine to m fragments, 20-30%, HCI rea	edium shell action							
0.GP	-	strong, strong cementation.					M	22+16+9	w=20.6%	
0 & 4C	_						_ ₈₅ _0	REC =17	n	
PT 300										
JG SF	7									
48 PL(-	fine to medium grained, wet,	gray, trace							
1200	-	HCI reaction weak.	ແs, ∠-၁%,							
G 06	1						M	6+12+18 N =30	w=31%	
VG LC	_						_ ₉₀ _	REC =18	n l	
30RII	_									
TEST I		continued on next pag	<i>je</i>							

ſ		hnabel	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	I	Boring Number:	B-321
1	Schnal				Calvert Cou	inty, Ma	ryland		0.93	Contract Number: 0 Sheet: 4 of 5	6120048
	DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLING	TESTS	REMARKS
	92.0 -	CLAYEY SAND, medium shell fra reaction weak.	, wet, gray, tr agments, 2-59	ace fine to %, HCl	SM SC	21.3		 95 -	4+8+12 N =20 REC =18	w=36.9% LL=59 PL=26 *	
	97.0 - - - -	SILTY SAND, w	et, greenish <u>c</u>	gray.	SM	-26.3		 -100-	4+9+13 N =22 REC =18	w=36.1% *	
		Remarks 105 ft:Resumed 7:15 am	Drilling on 6/	6/06 @				 - 105-	7+10+13 N =23 REC =17	w=58.2%	Resumed Drilling on 6/6/06 @ 7:15 am
	- 							 110- 	5+7+11 N =18 REC =18	w=42.6%	
SCHNABEL.GDI 3/6/08	- - -							 115-	5+4+9 N =13 REC =18	w=34.6% *	
5 06120048 PLOG SPL 300 & 400.GPJ								 120- - - - - - - - - - - - -	5+8+13 N =21 REC =18	w=39.8% *	
I EST BURING LU	-	continu	ied on next pag	10				 Ø	6+9+15	w=43.1%	

Schnabel Engineering BORING LOG Calvert County, Maryland Contract Number: 06120 Sheet: 5 of 5 DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH TESTS 125.0 SANDY ELASTIC SILT, wet, greenish MH -54.3 -125- N = 24 REC = 18" X	REMARKS
DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH TESTS 125.0 SANDY ELASTIC SILT, wet, greenish MH -54.3 -125- N = 24 REC = 18" TESTS	REMARKS
SM SM -54.3 N = 24 REC = 18" *	
125.0 SANDY ELASTIC SILT, wet, greenish MH -54.3	
I grav trace fine to medium chell	
fragments, 5-10%, HCl reaction	
- $ -$	
ELASTIC SILT, moist, greenish gray,	
\square trace sand \square	
- $ -$	
S_{A} = -100 $+12+15$ \times	
² 150.0 BOTTOM OF BORING @ 150.0 FT79.3 -150 -150 -150 -150 -150 -150 -150 -150	

Groundwater Observations Groundwater Observations Boring Contractor: UNITECH RELLING MALAGA, NEW JERSEY Boring Foreman: Denting MalaGA, NEW JERSEY Boring Equipment: MalaGA, NEW JERSEY Boring Equipment: CME-750 (ATV) Schnable Representative: K Negsinon Dates Stantel: Stantel: Schnable Representative: K Negsinon Dates Stantel: Stantel: Order State: State: Classe Cound Surface Elevation: 89.9 (feet) Out Forest litter, rootmati and topsoil. SM 0.4 Forest litter, rootmati and topsoil. SM 0.5 GLAYEY SAND, fine to medium grained, rest, brown, contains fair day pockets. SC 0.4 CLAYEY SAND, fine to medium grained, rest, strawed, with motied dark yellowish brown. SC 0.4 CLAYEY SAND, fine to medium, grained, wet, motied dark yellowish brown. SC 0.4 CLAYEY SAND, fine to medium, grained, wet, motied dark yellowish brown.	Schna	TEST Project: C BORING C	alvert Cli alvert Co	ffs Nucle ounty, Ma	ar Pow ryland	/er Pla	nt		Boring Contra Sheet:	Number: oct Number	er: 06120	B-322
Boring Contractor: U.NI-TECH DRILLING MALAGA, IREW JERSEY Boring Foreman: J. Bernings Diffing Method. Mul Rotary Drilling Method: Mul Rotary Drilling Method: Mul Rotary Drilling Method: Mul Rotary Diffing Method: Mul Rotary Dates Strate: SH306 Finished: 5/1306 Location: Northing: 21770.03 ft Easting: 960202.05 ft Ground Surface Elevation: 89.9 (feet) DEPTH PT FT STRATA DESCRIPTION CLASS. ELEV WUL SAMPLING Ground Surface Elevation: 89.9 (feet) DEPTH ARC = 14* Stratified brown and light brown or and light brown SILTY SAND, fine to medium grained, wet, dark yellowish brown, contains fat clay pockets. SILTY SAND, fine to medium grained, wet, dark yellowish brown, contains fat clay pockets. SILTY SAND, fine to medium grained, wet, dark yellowish brown, and yellowish brown. CLAYEY SAND, fine to medium grained, wet, motiled dark yellowish brown and light gray. 22.0 SANDY LEAN CLAY, fine to medium, grained, wet, motiled dark yellowish brown and light gray. 22.0 SANDY LEAN CLAY, fine to medium, grained, wet, motiled dark yellowish brown and light gray. 22.0 SANDY LEAN CLAY, fine to medium, grained, wet, motiled dark yellowish brown and light gray. 22.0 SANDY LEAN CLAY, fine to medium, grained, wet, motiled dark yellowish brown and light gray. 22.0 SANDY LEAN CLAY, fine to medium, grained, wet, motiled dark yellowish brown and light gray. 22.0 SANDY LEAN CLAY, fine to medium, moist, gray, trace mica. CL SANDY LEAN CLAY, fine to medium, motiled dark yellowish Brown and light gray. SANDY LEAN CLAY, fine to medium, motiled dark yellowish Brown and light gray. SANDY LEAN CLAY, fine to medium, stratified brown and page							Gr	Jundw	ator Obs	orvations	1	
Dording Foreman: Lake Inne Depti / Depti / Desting Diffing Method: Lisk foreman: Lake Inne Depti / De	Boring (חט ח	ato	Timo	Donth	Casing	Caved
Drilling Equipment: CME-750 (ATV) Schnabel Representative: K. Megginson Dates Startet: Sr1806 Finished: Sr1806 Location: Nothing: 217/T0.03 ft Ground Surface Elevation: 89.9 (feet) DEPTH STRATA DESCRIPTION CLASS: FLEV (FT) STRATA DESCRIPTION O.4 Forest litter, rootmat and topsoil. SILTY SAND, fine to medium grained, moist, brown, contains fact day pockets. 9.5 SILTY SAND, fine to medium grained, wet, dark yellowish brown, contains fact day pockets. 9.5 SILTY SAND, fine to medium grained, wet, dark yellowish brown, and light gray. 17.0 CLAYEY SAND, fine to medium grained, wet, dark yellowish brown, and light gray. 17.0 CLAYEY SAND, fine to medium grained, wet, dark yellowish brown, and yellowish brown, and light gray. 17.0 CLAYEY SAND, fine to medium grained, wet, dark yellowish brown and light gray. 22.0 SANDY LEAN CLAY, fine to medium, moist, gray, trace mica, continued on next page SC	Boring F	Foreman: J. Blemings		Enco	untere	d	5	/18		10.5'		
Drilling Equipment: CME-760 (ATV)	Drilling	Method: Mud Rotary										
Schnabel Representative: K. Megginson Dates State: Location: Northing: 217170.03 ft Easting: 990202.63 ft Ground Surface Elevation: 89.9 (feet) DEPTH (FT) STRATA DESCRIPTION CLASS. 0.4 Strest liter. rootmat and topsoil. moist, brown. SM 0.4 Strest liter. rootmat and topsoil. moist, brown. SM 0.4 Strest liter. rootmat and topsoil. moist, brown. SM 7.0 CLAYEY SAND. fine to coarse grained, moist, brown. contains fat clay pockets. SC 9.5 SILTY SAND. fine to coarse grained, moist, brown. contains fat clay pockets. SM 17.0 CLAYEY SAND. fine to medium grained, wet. dark yellowish brown and yellowish brown. SM 17.0 CLAYEY SAND, fine to medium grained, wet. dark yellowish brown and yellowish brown. SM 17.0 CLAYEY SAND, fine to medium grained, wet. mottled dark yellowish brown. SC 17.0 CLAYEY SAND, fine to medium grained, wet. mottled dark yellowish brown and light gray. SC 22.0 SANDY LEAN CLAY, fine to medium, most, gray, trace mica. CL	Drilling	Equipment: CME-750 (ATV)	_									
Dates Startet:	Schnabe	el Representative: K. Megginson										
Location: Northing: 19770.03 ft Easting: 980202.65 ft Ground Surface Elevation: 89.9 (feat) SAMPLING TESTS REMARKS 0.4 STRATA DESCRIPTION CLASS ELEV (FT) WL SAMPLING DEPTH DATA TESTS REMARKS 0.4 Stratata dispacilities most, brown. SM 89.5 - M N=24 N=24 N=24 N=24 3+344 N=24 N=26 = 13* -	Dates	Started: 5/18/06 Finished: 5/18/06										
Ground Surface Elevation: 89.9 (feet) Image: Constraint and Deposition of the constraint	Location	n: Northing: 217170.03 ft Easting: 960202.65 ft	-									
DEPTH (FT) STRATA DESCRIPTION CLASS ELEV (FT) WL SAMPLING DEPTH TESTS REMARKS 0.4 - Forest litter, rootmat and topsol. SM SM SM SS	Ground	Surface Elevation: 89.9 (feet)				_						
0.4 Forest litter, rootmat and topsoil. SM 89.5 Image: Construct on the construction of the co	DEPTH (FT)	STRATA DESCRIPTION	CLASS	. ELEV. (FT)	WL	DEP	S/ TH	AMPLI D	ING DATA	TEST	S F	REMARKS
SILTY SAND, fine to medium grained, stratified brown and light brown CLAYEY SAND, fine to coarse grained, moist, brown, contains fat clay pockets. SILTY SAND, fine to medium grained, moist, brown, contains fat clay pockets. SILTY SAND, fine to medium grained, clay lenses (<1/8 inch). CLAYEY SAND, fine to medium grained, dark yellowish brown and yellowish brown. CLAYEY SAND, fine to medium grained, wet, mottled dark yellowish brown and light gray. SAMDY LEAN CLAY, fine to medium, moist, gray, trace mica. CLAYEY SAND, fine to medium, frame dark yellowish brown and yellowish brown and light gray. CLAYEY SAND, fine to medium, moist, gray, trace mica. CLAYEY SAND, fine to medium, frame dark yellowish brown and yellowish brown and light gray. CLAYEY SAND, fine to medium, moist, gray, trace mica. CLAYEY SAND, fine to medium, moist, gray, trace mica. CLAYEY SAND fine to medium, frame dark yellowish brown and yellowish continued on next page	04	Forest litter, rootmat and topsoil.		89.5			M	1+2+2	2			
stratified brown and light brown stratified brown and light brown CLAYEY SAND, fine to coarse grained moist, brown, contains fat clay pockets. 9.5 SILTY SAND, fine to medium grained, wet, dark yellowish brown, contains lean clay lenses (<1/8 inch). 40.4 $\overline{\nabla}$ 17.0 CLAYEY SAND, fine to medium grained, wet, dark yellowish brown, contains lean clay lenses (<1/8 inch). 17.0 CLAYEY SAND, fine to medium grained, wet, mottled dark yellowish brown and light gray. 17.0 CLAYEY SAND, fine to medium moist, gray, trace mica. 17.0 22.0 SANDY LEAN CLAY, fine to medium, moist, gray, trace mica. 22.0 SANDY LEAN CLAY, fine to medium, 22.0 CLAYEY SAND, fine to medium, 22.0 SANDY LEAN CLAY, fine to medium, 22.0 SANDY LEAN CLAY, fine to medium, 22.0 CLAYEY SAND, fine to medium, 22.0 SANDY LEAN CLAY, fine to medium, 22.0 22.0 SANDY LEAN CLAY, fine to medium, 22.0 22		SILTY SAND, fine to medium grained, moist, brown.	SM	00.0		-	-14	N =4 REC	- =14"			
7.0 Stratified brown and light brown 7.0 CLAYEY SAND, fine to coarse grained, moist, brown, contains fat clay pockets. 9.5 SILTY SAND, fine to medium grained, wet, dark yellowish brown, contains lean clay lenses (<1/8 inch).	-							3+3+4	4			
7.0 Stratified brown and light brown 82.9 $3+3+4$ $N=7$ 7.0 CLAYEY SAND, fine to coarse grained, moist, brown, contains fat clay pockets. SC 82.9 $4+4+4$ 9.5 SILTY SAND, fine to medium grained, clay lenses (<1/8 inch).	-						Ň	N =7 REC :	=13"			
7.0 CLAYEY SAND, fine to coarse grained, moist, brown, contains fat clay pockets. 9.5 SILTY SAND, fine to medium grained, wet, dark yellowish brown, contains lean clay lenses (<1/8 inch). 4.4445 brown. 17.0 CLAYEY SAND, fine to medium grained, wet, motiled dark yellowish brown and light gray. 22.0 SANDY LEAN CLAY, fine to medium, moist, gray, trace mica. CLAYEY SAND, fine to medium, grained, wet, motiled dark yellowish brown and light gray. 22.0 SANDY LEAN CLAY, fine to medium, continued on next page CLAYEY SAND, fine to medium, grained, wet, motiled dark yellowish brown and light gray. CLAYEY SAND, fine to medium, grained, wet, motiled dark yellowish brown and light gray. CLAYEY SAND, fine to medium, grained, wet, motiled dark yellowish brown and light gray. CLAYEY SAND, fine to medium, motist, gray, trace mica. CLAYEY SANDY LEAN CLAY, fine to medium, motist, gray, trace mica. CLAYEY SANDY LEAN CLAY, fine to medium, motist, gray, trace mica. CLAYEY SANDY LEAN CLAY, fine to medium, motist, gray, trace mica. CLAYEY SANDY LEAN CLAY, fine to medium, motist, gray, trace mica. CLAYEY SANDY LEAN CLAY, fine to medium, motist, gray, trace mica. CLAYEY SANDY LEAN CLAY, fine to medium, motist, gray, trace mica. CLAYEY SANDY LEAN CLAY, fine to medium, motist, gray, trace mica. CLAYEY SANDY LEAN CLAY, fine to medium, motist, gray, trace mica. CLAYEY SANDY LEAN CLAY, fine to medium, motist, gray, trace mica. CLAYEY SANDY LEAN CLAY, fine to medium, motist, gray, trace mica. CLAYEY SANDY LEAN CLAY, fine to medium, motist, gray, trace mica. CLAYEY SANDY LEAN CLAY, fine to medium, motist, gray, trace mica. CLAYEY SANDY LEAN CLAY, fine to medium, motist, gray, trace mica. CLAYEY SANDY LEAN CLAY, fine to medium, motist, gray, trace mica. CLAYEY SANDY LEAN CLAY, fine to medium, motist, gray, trace mica. CLAYEY SANDY LEAN CLAY, fine t	_	stratified brown and light brown				- 5 -	M	3+3+4	4	*		
$\begin{array}{c c} 7.0 \\ \hline \\ CLAYEY SAND, fine to coarse grained, moist, brown, contains fat clay pockets. \\ 9.5 \\ \hline \\ 9.5 \\ \hline \\ \\ 9.5 \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $	-					- 1	-Ŵ	N =7 REC :	=10"			
9.5 SILTY SAND, fine to medium grained, wet, dark yellowish brown, contains lean olay lenses (<1/8 inch). dark yellowish brown and yellowish brown. 17.0 CLAYEY SAND, fine to medium grained, wet, mottled dark yellowish brown and light gray. 22.0 SANDY LEAN CLAY, fine to medium, moist, gray, trace mica. Continued on next page Continued on next page SANDY LEAN CLAY, fine to medium, moist, gray, trace mica. Continued on next page SANDY LEAN CLAY fine to medium, CL	7.0 -	CLAYEY SAND, fine to coarse grained, moist, brown, contains fat clay pockets.	SC	82.9]_[]	2+4+4	4			
9.5 SILTY SAND, fine to medium grained, wet, dark yellowish brown, contains lean clay lenses (<1/8 inch).		-		00.4		-	_Ň	N =8 REC :	=12"			
$\frac{17.0}{222.0} = \frac{Clay lenses (<1/8 inch).}{CLAYEY SAND, fine to mediumgrained, wet, motiled dark yellowishbrown and light gray.} = \frac{17.9}{CLAYEY SAND, fine to medium,grained, wet, motiled dark yellowishbrown and light gray.} = \frac{17.9}{CLAYEY SAND, fine to medium,grained, wet, motiled dark yellowishbrown and light gray.} = \frac{17.9}{CLAYEY SAND, fine to medium,grained, wet, motiled dark yellowishbrown and light gray.} = \frac{17.9}{CLAYEY SAND, fine to medium,moist, gray, trace mica.} = \frac{17.9}{CLAYEY SANDY LEAN CLAY, fine to medium,moist, gray, trace mica.} = \frac{17.9}{CLAYEY SANDY LEAN CLAY, fine to medium,moist, gray, trace mica.} = \frac{17.9}{CLAYEY SANDY LEAN CLAY, fine to medium,moist, gray, trace mica.} = \frac{17.9}{CLAYEY SANDY LEAN CLAY, fine to medium,moist, gray, trace mica.} = \frac{17.9}{CLAYEY SANDY LEAN CLAY, fine to medium,moist, gray, trace mica.} = \frac{17.9}{CLAYEY SANDY LEAN CLAY, fine to medium,moist, gray, trace mica.} = \frac{17.9}{CLAYEY SANDY LEAN CLAY, fine to medium,moist, gray, trace mica.} = \frac{17.9}{CLAYEY SANDY LEAN CLAY, fine to medium,moist, gray, trace mica.} = \frac{17.9}{CLAYEY SANDY LEAN CLAY, fine to medium,moist, gray, trace mica.} = \frac{17.9}{CLAYEY SANDY LEAN CLAY, fine to medium,moist, gray, trace mica.} = \frac{17.9}{CLAYEY SANDY LEAN CLAY, fine to medium,moist, gray, trace mica.} = \frac{17.9}{CLAYEY SANDY LEAN CLAY, fine to medium,moist, gray, trace mica.} = \frac{17.9}{CLAYEY SANDY LEAN CLAY, fine to medium,moist, gray, trace mica.} = \frac{17.9}{CLAYEY SANDY LEAN CLAY fine to medium,} = \frac{17.9}{CLAYEY SANDY LEAN CLAYEY fine to medium$	9.5	SILTY SAND, fine to medium grained, wet, dark yellowish brown, contains lean	SM	80.4	⊻	-10-						
$17.0 = \frac{1}{22.0} = \frac{1}{2} $	-	clay lenses (<1/8 inch).				-	-M	5+8+1 N =18 REC :	10 } =15"			
$\frac{17.0}{22.0} = \frac{\text{dark yellowish brown and light gray.}{\frac{17.0}{22.0}} = \frac{17.0}{22.0} = \frac$	-	-										
$17.0 - \frac{15-1}{22.0} = \frac{15-1}{2} = 15-1$	-	dark yellowish brown and yellowish brown.				-	-0	4+4+{ N =9	5			
17.0 - CLAYEY SAND, fine to mediumgrained, wet, mottled dark yellowishbrown and light gray. $22.0 - SANDY LEAN CLAY, fine to medium,moist, gray, trace mica.- continued on next page$	— —					-15-		REC	=13"			
22.0 CLAYEY SAND, fine to medium grained, wet, mottled dark yellowish brown and light gray. SC 12.3 22.0 SANDY LEAN CLAY, fine to medium, moist, gray, trace mica. CL 67.9 - - - - -	170 -			72 0								
22.0 = 3000000000000000000000000000000000000	-	CLAYEY SAND, fine to medium grained, wet, mottled dark yellowish brown and light gray	SC	12.5		-	$\left \right $					
$22.0 \frac{1}{22.0} \frac{1}$	-					-	-0	WOH N = M	/18" VOH/18"			
22.0 SANDY LEAN CLAY, fine to medium, moist, gray, trace mica. <i>continued on next page</i>						-20-		REC	=18"			
SANDY LEAN CLAY, fine to medium, moist, gray, trace mica. CL Or.9				67.0								
$ \begin{array}{c} - & & \\ - & & $	- 22.0	SANDY LEAN CLAY, fine to medium, moist, gray, trace mica.	CL	01.5		-	$\left \right $					
continued on next page	-	-				-	-0	2+2+4 N =6	4			
		continued on next page				-25-		REC	=18"			

Γ		TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring	Number:	B-322
	Schna	bel Engineering LOG	c	alvert Cou	inty, Ma	ryland		Contra Sheet:	ct Number: 06 2 of 4	6120048
ļ	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	SAI DEPTH	MPLING DATA	TESTS	REMARKS
		with fine to medium sand.		CL			 30 	REC =28"	PP=2.75 tsf	*Shelby tube sampler push from 28.5 to 30.5 ft.
	32.0 ·	FAT CLAY, moist, light greer and gray, trace fine to mediuu and mica, contains silty sand	iish gray m sand lenses.	СН	57.9		 - 35- 	2+3+5 √ =8 REC =18"		
	37.0 ·	SILTY SAND, fine to medium wet, gray.	grained,	SM	- 52.9		 ∎ F 40■	REC =27"	PP=NP tsf	*Shelby tube sampler push 38.5 from 39.9 ft.
8	42.0 ·	ELASTIC SILT, moist, light g gray, trace fine sand, and mid	reenish ca.	MH	- 47.9		 - 45-	5+7+9 N =16 REC =18"	PP=3.50 tsf	
400.GPJ SCHNABEL.GDT 3/6/0	47.0 · · -	CLAYEY SAND, fine to medi grained, moist, gray, trace mi	um ca.	SC	42.9		 ∎ F 50 	REC =10"	PP=NP tsf	*Shelby tube sampler push from 48.5 to 49.3 ft.
LOG 06120048 PLOG SPT 300 &	52.0 ·	SANDY SILT, fine to medium gray, trace mica.	ı, moist,	ML	37.9			9+34+50/5" \ =84/11" REC =17"		*Switched to 3-7/8" O.D. Tri-cone roller bit below 53.5 ft. *Sampler refusal at 54.9 ft. *Difficult to very
TEST BORING	57.0 .	SILTY SAND, fine to medium wet, gray, trace fine to mediu <i>continued on next pag</i>	l grained, m shell ge	SM	32.9					advacement

	TEST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Boring	Number:	B-322
Schna	bel Engineering LOG	Calvert Cou	inty, Ma	ryland		Contra Sheet:	ct Number: 00 3 of 4	6120048
DEPTH	STRATA DESCRIPTION	CLASS.	ELEV.	WL	SAMP	ING	TESTS	REMARKS
(F1)	fragments (+5%) contains black	SM	(F1)		DEPTH	DATA		from 55.5 to 56
-	particles (1/16 inch), strong HCI reaction (strong HCI reaction with shell fragments only).				X 31+6 N =5 60	i0 0 =10"		ft. *Moderate to difficult rotary advancement below 57 ft.
62.0 ·	LEAN CLAY, moist, gray, trace fine to medium sand, and mica, weak HCI reaction.	CL	- 27.9		 	-9 6 =18"		
	with fine to medium sand.				 	-6 0 =18"		*Moderate to difficult rotary
72.0	CLAYEY SAND, fine to medium grained, moist, greenish gray, trace fine to coarse shell fragments (±5%), contains indurated clayey sand layers from 73.5 to 73.8 ft, strong HCI reaction. contains strongly cemented sand layer from 73.8 to 74 ft.	SC	17.9		 ⊠ 50/5 50/5 N =5 75	, 0/5" =5"		advancement below 72 ft (moderate to strong rig chatter). *Very difficult rotary advancement from 75 to 76 ft (strong rig
78.5	SILTY SAND, fine to medium grained, wet, gray, few fine to coarse shell fragments (±10%), strong HCI reaction.	SM	11.4		 7+9- 7+9- N =2 REC	-11 0 =18"		chatter). *Moderately difficult rotary advancement from 76 to 78 ft. *Very difficult rotary advancement from 78 to 78.5
	dark greenish gray, little fine to coarse shell fragments (±20%), moderate HCl reaction.				 	3+13 6 =18"		π (strong rig chatter).
06 UB120048 PLOG SP1 30.	light greenish gray, trace fine to medium shell fragments (±5%), weak HCl				 N = 2	+14 5		
	continued on next page				_ ₉₀ _//] rec 	=18"		

ſ	6	bachal	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-322
	Schnat			Calvert Cou	nty, Ma	iryland		ľ	Contra Sheet:	ct Number: 06	6120048	
ł	DEPTH			I		FLEV		s		G		
	(FT)	STRATA	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DA	ТА	TESTS	REMARKS
ſ					SM							
	92.0 -	CLAYEY SAND,	fine to medi	um	SC	-2.1						
	-	HCI reaction.	ay, trace mica	a, weak								
	-							10	N =21			
	_							_ ₉₅ _[/]	REC =1	8"		
	_											
	-											
	-	blueish gray and	gray, trace f	ine to				10	4+5+11			
	100.0 —		jments (±5%)).		-10.1		L_100-10	REC =1	8"		
		BOTTOM OF BO	ORING @ 10	0.0 FT.		n 8996 D		70 10990940				
3/6/08												
เต่อ.												
VABEL												
SCH												
U.GPJ												
J & 4UI												
130												
0 90												
048 PI												
N2190												
POC.												
PKING												
SI BC												
ESI BURING LUG												

	hnabel TEST F	Project: Calve	rt Cliff	s Nucle	ar Pow	/er Pla	nt		Boring	Number:		B-323
Schnal	bel Engineering LOG	Calve	ert Cou	inty, Ma	ryland				Contra Sheet:	ct Number 1 of 7	er: 061	20048
Boring C	contractor: UNI-TECH DRILLING	3					Gro	oundw	ater Obs	ervations		
	MALAGA, NEW JER	SEY					D	ate	Time	Depth	Casi	ng Caved
Boring F	oreman: J. Blemings			Enco	untere	d	6	6/7		18.5'	0.0	·
Drilling I	Equipment: CME-750 (ATV)			Start	of Day	у	6	6/8		0.0'	0.0	
Schnabe	I Representative: M. Arles			Start	of day	y	6	/12		20.0'	0.0	
Dates 3	Started: 6/7/06 Finished: 6/14	1/06		Start	of Day	у	6	/13		0.0'	0.0	·
Location	: Northing: 217027.97 ft Easting: 960060.86 ft											
Ground	Surface Elevation: 107.5 (feet)											
DEPTH (FT)	STRATA DESCRIPTIO		ASS.	ELEV. (FT)	WL		S/ тн	AMPLI	ING ATA	TEST	s	REMARKS
	POORLY GRADED SAND, fine	grained,	SP				M	1+1+3	3		(0-4' drag bit
	moist, orange.					-	ΗŇ	N =4 REC :	=16"			
						-				50		
	fine to coarse, with gravel.						-M	3+3+6 N =9	5	w=5%	D	
								REC	=13"			
4.5	POORLY GRADED SAND WIT	H SILT, SI	P-SM	103.0		- 5 -						
_	moist, orange					L.	JXI	/+9+8 N =17	3			
								REC :	=12"			
						Γ	$\overline{\mathbf{n}}$	0+11-	L10	w=139	%	
-							٦XI	N =21	-1.4"	*		
-						- ·		REC	=14			
10.0 —	POORLY GRADED SAND WIT	H SILT, SI	P-SM	97.5		-10-						
	fine to medium grained, moist,	yellow.					-M	7+9+1 N =20	11			
						L .		REC	, =15"			
_						L.						
00							Π	6+9+9	a	w=16.2	%	
						[ĪXI	N =18	3	*		15 15' orongo
						-15-						mud return
						-	$\left \right $					
17.0 -	SILTY SAND fine to coarse gra	ained	SM	90.5		-	$\left \right $					
- -	wet, orange and brown, with sill	t, 1/8"			∇	-	$\left \right $					
- 18	color lenses.				Ŧ	L .	M	10+20	0+20	w=11.9)% >	
						L-20-	Ň	N =40 REC :) =17"	PL=N	P	
0 9 0										â		
						[[1					
22.0 -	CLAYEY SAND, fine to coarse	grained,	SC	85.5		F 1	1					
- -	wet, orange and red, 1/4" pink of lenses .	clay				F :						
- 19							-M	2+2+2 N =4	2			
						-25-	$ \Delta $	REC	=16"			
2	continued on next page											

	hnabel Dopu	Project:	Calvert Cliffs Nuclear Power Plant Calvert County, Maryland					Boring Number: B-323		
Schna	bel Engineering LOG	IG	Calvert Cou	nty, Ma	ryland		Cont Shee	ract Number: 0 t: 2 of 7	6120048	
DEPTH (FT)	STRATA DESCR	PTION	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLING	TESTS	REMARKS	
_			SC							
27.0 -	POORLY GRADED SANI coarse grained, wet, oran gravel), fine to ge, trace	SP	80.5						
-						 	8+9+10 N =19	w=17.6% *		
32.0 -	POORLY GRADED SANI fine to coarse grained, we) WITH SILT, t, orange	SP-SM	75.5						
-						 	7+8+9 N =17 REC =13"			
-						 M	8+15+9	w=20.7%		
-						_₄o_Ŭ 	N =24 REC =17"			
42.0 -	SILT, wet, gray, with sand		ML	65.5		 	81010			
-	mottled grayish orange.						N =18 REC =18"		45-70' grayish mud return	
47.0 -	SANDY FAT CLAY, fine to moist, dark gray.	o medium,	СН	60.5						
						 	3+2+5 N =7 REC =18"	w=28.1% LL=50 PL=17 *		
						 M	3+3+4			
						_ ₅₅ _	N =7 REC =18"			
	no sand, very stiff.									
	continued on next	page								

	50	hnabel BORING	Project: Ca Ca	Calvert Cliffs Nuclear Power Plant Calvert County, Maryland					Boring Number: B-323 Contract Number: 06120048		
	Schnal	bel Engineering LOG						She	et: 3 of 7		
	DEPTH (FT)	STRATA DESCRIPTIC	ON	CLASS.	ELEV. (FT)	WL	S/ DEPTH	AMPLING DATA	TESTS	REMARKS	
	_			СН			M	1+4+6 N =10	w=35.1% LL=65		
							_ ₆₀	REC =18"	PL=22		
	-										
	-										
	-	with sand.					M	6+10+12 N =22 PEC =18"			
	_						65 [1] 				
	67.0 -	CLAYEY SAND, fine to mediun	n	SC	40.5						
	-	grained, moist, green.						8+12+12	w=29%		
	_						_ ₇₀ W	N =24 REC =18''	LL=46 PL=24 *	70' greenish	
	71.0 -	POORLY GRADED SAND WIT	TH SILT,	SP-SM	36.5					71' harder drilling	
	-	green, with fine to coarse shell fragments, strong HCI reaction									
	-						8	34+50/3" N =50/3"			
							-75-	REC =6"			
	77.0 -	FINE TO MEDIUM SANDY LE	AN	CL	30.5						
	-	CLAY, moist, green, with fine to shell fragments, strong HCI rea 60-70% shell frag.	o coarse action,					5+5+7			
3/6/08	_	trace sand, no shells.					W	N =12 REC =18"			
EL.GDT	-										
SCHNAB	-	moist, green, contains fine to c shell fragments, moderate HCl	oarse reaction.								
400.GPJ	-							REC =16"	w=36.2% LL=42		
PT 300 & .	_						-85-		*		
PLOG SI	-										
16120048	88.0 -	SILTY SAND, fine to medium g	grained,	SM	19.5			30+33+15			
IG LOG C	_	fragments, strong HCI reaction. shell frag .	, 50-60%				V _ ₉₀ _ V	N =48 REC =18"			
TEST BORIN	-	continued on next page									

		2	habol	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	y Number:	B-323
	Schn	abe	el Engineering	c	alvert Cou	nty, Ma	ryland			Contra Sheet:	act Number: 06 : 4 of 7	6120048	
	DEPTH (FT)	1	STRATA D	ESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH		IG TA	TESTS	REMARKS
						SM							
										24+16+	+33	w=26.3%	
	_								_ ₉₅ _/	N =49 REC =	18"	PL=NP *	
		_											
		-											
		-											
		-	30-40% shell frag.)	4+8+11 N =19	1		
	-								-100-	KEC =	18"		
	102.0						55						
	102.0	_	POORLY GRADED fine to medium grain	SAND W	/ITH SILT, t, green,	SP-SM	5.5						
		_	with fine to coarse s strong HCI reaction,	shell fragn , 20-30%	nents, shell frag.				17	8+12+1	14	w=28.6% LL=NP	
	-	_							_105_U	REC =	18"	PL=NP *	
		-											
	107.0	-	SILTY SAND, fine to	o medium	grained,	SM	0.5						
		-	fragments, moderat	e HCl rea	ction,					7 3+6+9			
	_	_								N =15 REC =	18"		110' more
		_											sandy drilling
		_											
3/6/08		-											
EL.GDT		-)	4+7+12 N =19	2	w=30.2%	
CHNAB	-								-115-	KFC =.	18"		116 bard laver
GPJ SC													shells
3 & 400.			with fine to coarse s strong HCI reaction,	shell fragn , 70-80%	nents, shell frag.								
SPT 300		_								50/5"	5"		118.5 switch to roller bit 118 5 ric
PLOG (-	_							-120-	REC =	5"		chatter
120048		-											
00 00		-											
JRING L										10+50/	5"	w=19.4%	
TEST BC			continued o	on next pag	le						0		
		hpabel TEST	Project: Cal	lvert Cliffs	s Nucle	ar Pow	er Plant		Boring Numbe	er:	B-323		
--------------------	---------------	--	-------------------------------------	--------------	---------------	--------	--------------	-----------------------------	-------------------------------	------------------	-----------------------------		
	Schna	bel Engineering LOG	Cal	lvert Cou	nty, Ma	ryland			Contract Num Sheet: 5 of 7	ber: 06	6120048		
	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		G TES	STS	REMARKS		
	_			SM			125	N =50/5 REC =1	1"		125' start of day		
	-										0,0,00		
	-												
	-	trace fine to coarse shell frag moderate HCI reaction, 0-10% frag.	ments, 6 shell				 	8+15+25 N =40 REC =14	5 8"				
	-												
	-	with fine to coarse shell fragm strong HCl reaction, 10-20% s	ients, shell frag.				 	9+12+15 N =27	5 w=33	8.1%			
	-						135 _						
	138.0 -	POORLY GRADED SAND W	ITH SILT,	SP-SM	-30.5								
	_	fine to medium grained, moist trace fine to medium shell frag weak HCl reaction, 0-5% she	, green, gments, I frag.					6+9+20 N =29 REC =18	8"				
	- 142.0 -				-34.5								
	-	SANDY ELASTIC SILT, fine t grained, moist, green, trace fi medium shell fragments, wea reaction, 0-5% shell frag.	o medium ne to k HCl	МН			 [] []	7+10+1: N =23 REC =1	3 w=48 LL= 8" PL=	9.3% 73 38	144.5 switch to drag bit		
EL.GDT 3/6/08	-												
GPJ SCHNABE	-						 []	10+12+1 N =27 REC =18	15				
PT 300 & 400.	-												
PLOG SF	153.0 -			NAL	-45.5		_]						
5 LOG 06120048 F	-	fragments, strong HCl reaction shell frag.	n grained, se shell n, 60-70%	IVIL				11+17+2 N =44 REC =18	27 w=31 LL= 8" PL= *	.3% 39 30			
FEST BORINC	-	continued on next pag	e										

Comments: 1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion. 2. Downhole Geophysical Testing Performed on 6/14/2006 3. * = See Appendix I for additional lab testing data. 4. Ground water observation well OW-323 installed at nearby location.

20	hnabel TEST BORING	Project: C	Calvert Cliff Calvert Cou	s Nucle nty, Ma	ar Pow ryland	er Plant	Borir Cont	ng Number: ract Number: 0	B-323
Schna	bel Engineering LOG		1				Shee	t: 6 of 7	
DEPTH (FT)	STRATA DESCRIPT	TION	CLASS.	ELEV. (FT)	WL			TESTS	REMARKS
-	trace fine to coarse shell fraç 0-10% shell frag.	ments,	ML			 	6+10+12 N =22 REC =18"		
- - 163.0 - -	FINE TO MEDIUM SANDY E SILT, moist, green.	ELASTIC	MH	-55.5		 165-	7+12+16 N =28 REC =18"	w=54.2% *	
- 167.0 - - -	SILTY SAND, fine to mediun moist, green, with fine to coa fragments, strong HCI reaction shell frag.	n grained, rse shell on, 10-20%	SM	-59.5		 170-	7+8+13 N =21 REC =18"		
172.0 - - - -	SANDY FAT CLAY, moist, g sand, moderate HCI reaction	reen, with	СН	-64.5		 175-	6+8+13 N =21 REC =18"	w=44% LL=97 PL=31 *	
- 179.2	SAND, fine to coarse grained grayish green, with silt.	I, moist,	SP-SM	-71.7		 ■ 180 	REC =0"		180' Start of day 6/12/06
182.0 -	FAT CLAY, trace sand, mo	st, green.	СН	1-74.5		 185- -	8+11+16 N =27 REC =18"	w=68.3% LL=124 PL=33 *	
	continued on next pa	ge				 190-	7+11+12 N =23 REC =18"		

Comments: 1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion. 2. Downhole Geophysical Testing Performed on 6/14/2006 3. * = See Appendix I for additional lab testing data. 4. Ground water observation well OW-323 installed at nearby location.

	hnabol	TEST	Project: C	alvert Cliffs	s Nucle	ar Pow	er Plant		Boring	y Number:	B-323
Schna	bel Engineering		alvert Cou	nty, Ma	ryland			Contra Sheet:	act Number: 0 7 of 7	6120048	
DEPTH (FT)	STRAT	STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMP CH CH					SAMPL H C	ING ATA	TESTS	REMARKS	
-	-			СН				7+11- N =25	+14	w=58.1% LL=116	
195.0 — - -	SANDY ELASTI medium shell fra frag.	IC SILT, trace agments, 0-5º	e fine to % shell	MH	-87.5		195 	() REC	=18" +12	PL=36 * w=52.9%	
200.0 —	BOTTOM OF B	ORING @ 20	0.0 FT.		-92.5		-200-4	N =23 REC	3 =18"	LL=97 PL=62 *	
00100/0											
м Л											

Comments: 1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion. 2. Downhole Geophysical Testing Performed on 6/14/2006 3. * = See Appendix I for additional lab testing data. 4. Ground water observation well OW-323 installed at nearby location.

Schnat	TEST Project: C BORING C C Del Engineering LOG C	alvert C alvert C	cliffs Nucle county, Ma	ear Pov aryland	ver Pla	nt	E	Boring Contra Sheet:	Number: Inct Number 1 of 4	er: 06120	B-324
Boring C	contractor: CONNELLY AND ASSOCIATES					Gro	undwate	r Obs	ervations		
Doning C	FREDERICK, MARYLAND	, 1110.				Da	ate Ti	ime	Depth	Casing	Caved
Boring F	oreman: W. Wolfe		Enco	ountere	ed	71'	13		27.0'		
Drilling N	Method: Mud Rotary		Star	t of Da	y	71	14		25.0'		
Drilling E	Equipment: CME-550 (ATV)	F									
Schnabe	I Representative: K. Bell										
Dates S	Started: 7/12/06 Finished: 7/14/06										
Location	: Northing: 216906.4 ft Easting: 960114.44 ft										
Ground	Surface Elevation: 105.2 (feet)										
DEPTH (FT)	STRATA DESCRIPTION	CLAS	S. ELEV	WL	DEP	SA TH	MPLING	A	TEST	S F	REMARKS
0.6	ROOTMAT AND TOPSOIL.		104.6								
-	POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, yellowish brown, trace gravel	SP-SN	M				1+2+1 N =3 REC =10	0			
-	yellowish brown and reddish brown				L .	- <u>M</u>	2+2+2 N =4				
_							REC =13	u			
-					- 5 -	M	2+2+3 N =5				
					[,		REC =12	u			
-						-[]	3+4+4 N =8				
_					-		REC =15	ļ			
							1+1+3 N =4 PEC =11	u			
12.0 -	SILTY SAND, fine to coarse grained,	SM	93.2								
-	moist, orangeish brown, trace gravel.				-	-M	4+4+5 N =9 REC =16'	u			
							21415				
						-	N =9 REC =16	u			
17.0 -	POORLY GRADED SAND WITH SILT	SP-SM	M 88.2		F .	+					
5 _	fine to medium grained, moist, yellowish brown and orangeish brown, trace gravel.						5+7+7 N =14 REC =10	u			
19.5		1010 11	85.7		Γ						
	SILTY SAND, fine to coarse grained, moist, orangeish brown and yellowish brown, trace gravel.	SM			-20-		3+4+7 N =11				
						Ш	REC =15	••			
22.0 -	0 CLAYEY SAND, fine to medium grained, wet, orangeish brown and		83.2			-M	5+4+5 N -9				
-						Ш	REC =9"				
	continued on next page				-25-						
<u> </u>											

	-	hnabel TEST	Project: (Calvert Cliff	s Nucle	ar Pow	er Plant	I	Boring Num	ber:	B-324
Sc	hnat	bel Engineering LOG		Calvert Cou	nty, Ma	aryland		0	Contract Nu Sheet: 2 of	mber: 0 4	6120048
DEP (F1	тн Г)	STRATA DESCRIP	TION	CLASS.	ELEV. (FT)	WL	S DEPTH			ESTS	REMARKS
				SC			M	3+2+2 N =4	<u></u>		
						∇		REC =10)"		Resumed drilling on
	_	Remarks 27 ft:Resumed drilling on 7-	13-06 @			_		2+2+3			7-13-06 @ 7:00 am
	_	7:00 am					L W	N =5 REC =11	u		
30.	o —	POORLY GRADED SAND	MITH SILT,	SP-SM	75.2		-30-M	3+4+5			
	-	fine to medium grained, wet brown.	orangeish				W	N =9 REC =7"			
	-							4+6+7			
	_						[]	N =13 REC =10)''		
34.	5_	CLAYEY SAND, fine to coar	se grained,	SC	70.7		-35-0	0.0.40			
	_	brown.	ellowish				X	N =16 REC =12	2"		
	-							202 02405 22405			
38.	5	orangeish brown and reddis trace gravel	h brown,		66.7		M	3+5+7 N =12 REC =18	ξıı		
	_	SANDY FAT CLAY, moist, c brown and reddish brown, ir	orangeish on staining,						,		
	_	_ gray						1+2+3 N =5			
	_							REC = 18			
	-						M	2+2+3 N =5			
	-						0	REC =18	3"		
	_						⁻⁴⁵⁻	2+2+3 N =5			
0/0							שך	REC =18	3"		
- COL 20							M	3+3+3 N =6			
INABEL	-						L 10	REC =18	3"		
	_	black cemented sand lenses	6				-50-M	2+4+4			
5 400.0	_				52.0		- 10	REC =18	3"		
52.	U -	SILTY SAND, fine to mediur wet, gray.	n grained,	SM	53.2		[]_m	10+18+2	8		
ALOG O	_						Ļ _₩	N =46 REC =18	3"		
84007L	5 _	FAT CLAY, moist, gray, trac	e sand.	СН	50.7		-55-0	3+4+5			
90 190	-						F - Ŭ	N =9 REC =18	3"		
DKING L	-							3+4+7			
ц П П	_	continued on next pa	ge								

		hpabol TEST	Project: Ca	t: Calvert Cliffs Nuclear Power Plant Calvert County, Maryland					Boring Number: B-324		
	Schnal	bel Engineering LOG	Ci	alvert Cou	nty, Ma	iryland			Contra Sheet:	ct Number: 06 3 of 4	6120048
	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLIN	G TA	TESTS	REMARKS
	_			СН				N =11 REC =1	8"		
	_						-60-		14 II	PP=>4.5 tsf	
	-							REC =2	1		
	- 62.5				42.7						
	-	SANDY LEAN CLAY, wet, gr	ay.	CL				4+5+7 N =12 REC =1	8"		
	64.5	SANDY FAT CLAY, moist, lig	iht gray.	СН	40.7		-65-0				
	-						X	N =16 REC =1	8"		
	67.0 -	SILTY SAND, fine to medium	grained,	SM	38.2				50/41		
	_	wet, gray, strong cementation	1.				- 18	N =86/1 REC =1	50/4" 0" 6"		
	_						_70_	REC =2	22"		
	-										
	-								00		
	_	fragments, 50-60%, HCl read	ction				X	N =42 REC =1	∠6 8"		
	74.5	SANDY ELASTIC SILT, wet,	gray and	MH	30.7		-75-0	4.7.0			
	-	fragments, 30-40%, HCl read strong.	ction				X	N =16 REC =1	8"		
	-	areonich arey, trees cond tre	an finn to					41516			
	-	medium shell fragments, 2-5 reaction weak	%, HCI					N =11 REC =1	8"		
3/6/08	_						-80-0	4+5+6			
EL.GDT	-						X	N =11 REC =1	8"		
CHNABE	-	trace organic matter						3+3+4			
GPJ S	_						[][X	N =7 REC =1	8"		
00 & 400	84.5	SILTY SAND, fine to medium	grained, with fine	SM	20.7		- ⁸⁵ -X	50/5"			
G SPT 3	-	to coarse shell fragments, 50 strong cementation, HCI read	-60%, tion					N =50/5 REC =5)")"		
748 PLO		strong. contains fine to coarse shell t	ragments					KEC =3 19+12+	13		
061200	-	40-50%, strong cementation reaction strong	, HCI				[]X	N =25 REC =1	8"		
NG LOG	_						-90-M	9+19+5	0/4"		
ST BORI	-	continued on next pag	je				Ň	N =69/1	0"		
Щ											

	hashal TES	T Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	B	oring Number:	B-324
Schnal	bel Engineering	NG	Calvert Cou	inty, Ma	iryland		C	ontract Number: (6120048
DEDTIN		0							
(FT)	STRATA DESCI	RIPTION	CLASS.	ELEV.	WL	ПЕРТН		TESTS	REMARKS
			SM				REC =16"		
-									
-	contains fine to coarse s	hell fragments,				M	5+7+9		
_	30-40%					L JM	REC =18"	8	
	contains fine to coarse s	hell fragments,				M	5+6+11		
-	20-30%, HCI reaction m	oderale				- 10	REC =18"	9	
-									
-	gray and white, contains	fine to coarse				M	9+13+16		
_	shell hagments, 10-20%					L JM	REC =18"	8	
						100			
						M	4+6+10		
101.5				3.7		0	REC =18"	8	
	BOTTOM OF BORING @	2) 101.5 FT.							
,									
í í									
-									
1									
5									
5									
- -									
5									

SC	hnabel BORIN	Project:	Calvert Calvert	Cliffs Coun	Nuclea ity, Ma	ar Pow ryland	/er Pla	nt		Boring	Number:	r: 061	12004	B-325
Schnal	bel Engineering LOG					-				Sheet:	1 of 4		1200-	10
Boring C	Contractor: CONNELLY AN	D ASSOCIAT	ES. INC.					Gro	ound	vater Obs	ervations			
y _	FREDERICK, M	ARYLAND	,					D	ate	Time	Depth	Casi	ng	Caved
Boring F	oreman: D. Bender				Enco	untere	d	5/	23		23.5'			
Drilling	Fruinment: CME FEOX (AT)	N												
Schnabe	el Representative: K Bell)												
Dates	Started: 5/23/06 Einished	5/23/06		<u> </u>										
Location	Northing: 216948.98 ft	3/23/00											_	
	Easting: 960549.73 ft											-		
Ground	Surface Elevation: 85.0 (feet)												
DEPTH (FT)	STRATA DESCRI	PTION	CLA	ss. ^E	ELEV. (FT)	WL	DEP	S/ ТН	AMPL C	ING DATA	TEST	s	RI	EMARKS
0.6	_ ROOTMAT AND TOPSOIL				84.4									
-	POORLY GRADED SAND fine to coarse grained, moi	WITH SILT, st, yellowish	SP-9	SM	01.1				1 REC	=12"				
	gravel.	s, ii ace							37.07	2				
-	^L orangeish brown.							IXII	N =4	4.01				
4.0 -	SILTY SAND, fine to coars	e grained,	SN	N I	81.0				REU	=18				
_	moist, orangeish brown an brown. trace gravel.	d reddish					- 5 -		2+2+	3				
_							L .	-IXII	N =5	-10"				
_							L .		REC	=18				
1200	orangeish brown and grav	fine to							3+2+	3				
-	medium grained.	inte to					F .	IXII	N =5	471				
-									REC	=17				
-							-10-	+						
_	trace root fragments.						- ·	-M	3+3+	3				
							L	Ш	N =6 REC	=11"				
_ ۹								ᅰ	2.2.	2			Colo	r change in
	gray and orangeish gray.						-	IXII	3+3+ N =6	3			tub fi	rom
							-15-		REC	=17"			brow	n to gray at
- ABEL							L .	-					14.5	ft.
170 -					68.0		L							
	FAT CLAY, moist, gray and	d greenish	CH	+	00.0									
400.4	gray, trace saria.						F	ᅰ		-				
× -								HXII	2+3+ N =6	3				
							-20-		REC	=18"				
							L .							
1040														
							[`	1						
						$\overline{\Delta}$	F *	╎						
	wet.							-11/1	2+3+ N =7	4				
	continued on next i	ade					-25-		REC	=18"				
8		9~												

		TEST	Project: C	Calvert Cliffs Nuclear Power Plant Calvert County, Maryland					Boring Number: B		
	Schna	bel Engineering LOG		alvert Cou	nty, Ma	ryland		Cont Shee	ract Number: 0 et: 2 of 4	6120048	
	DEPTH (FT)	STRATA DESCRI	PTION	CLASS.	ELEV. (FT)	WL	S/ DEPTH	AMPLING DATA	TESTS	REMARKS	
ľ	_			СН							
	27.0 -				58.0						
	-	SILTY SAND, fine to medic wet, gray and black.	m grained,	SM							
	-	-					M	3+4+10 N =14			
	_						_ ₃₀ _[/]	REC =16"			
	-	-									
	32.0 -	FAT CLAY, moist, gray, tra	ce sand.	СН	53.0						
	-	-					M	4+7+10 N =17			
		-					_ ₃₅ []	REC =18"			
	-	-									
	37.0 -	CLAYEY SAND, fine to me grained, moist, greenish gra	dium ay and gray.	SC	48.0						
	_						M	6+9+17			
		-					_ ₄₀	REC =18"			
	-	-									
	42.0 -	SILTY SAND, fine to coarse moist gray trace fine to me	e grained,	SM	43.0					Harder drilling at 42 ft.	
	_	fragments (5-10%), HCl re	action weak.					31+50			
		-					-45-	N =50 REC =12"			
80	-	-									
DT 3/6/0	-	wet, gray and white									
NBEL.GD	-							31+50			
SCHN/	_	-					_50_	N =50 REC =12"			
00.GPJ	-	-									
300 & 4	-	trace fine to coarse shell fra	igments								
OG SPT	-	(50-60%), HCI reaction str	ong.					17+26+18			
0048 PL	_]					_ ₅₅ _	N =44 REC =14"			
G 0612	-										
SING LO	57.0 -	SANDY ELASTIC SILT, we	t, gray and	мн	28.0						
EST BOF	-	greenish gray, trace fine to continued on next p	medium age								
۳L											

	TEST	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant	Boi	ing Number:	B-325
Schna	bel Engineering LOG	Ca	alvert Cou	nty, Ma	ryland		Co She	ntract Number: 0 eet: 3 of 4	6120048
DEPTH (FT)	STRATA DESCRIPT	TION	CLASS.	ELEV. (FT)	WL	S/ DEPTH	AMPLING DATA	TESTS	REMARKS
-	shell fragments (2-5%), HCl weak.	reaction	MH				2+4+6 N =10 REC =16"		Rig chatter at 60.5 ft.
62.0 - -	CLAYEY SAND, fine to medi grained, wet, light gray and g gray, trace fine to coarse she fragments (20-30%), HCl rea moderate.	um reenish Il action	SC	23.0		 	36+10+12 N =22 REC =18"		
67.0 ·	SILTY SAND, fine to coarse wet, gray and greenish gray, to coarse shell fragments (10 HCI reaction moderate.	grained, trace fine 0-20%),	SM	18.0		 	7+7+7 N =14 REC =18"		
-						 	7+10+9 N =19 REC =17"		
	fine to medium grained, trace medium shell fragments (<5% reaction weak.	e fine to %), HCI				 	6+7+10 N =17 REC =17"		
	trace fine to medium shell fra 2-5%, HCl reaction weak.	gments,				 85	4+7+10 N =17 REC =18"		
	SANDY ELASTIC SILT, wet, white, trace fine to coarse sh fragments (15-25%), HCI rea moderate.	gray and ell ction	MH	-2.0		 	5+5+7 N =12 REC =18"		
	continued on next pag	де							

	hashal	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-325		
Schna			Calvert Cou	nty, Ma	iryland			Contrac Sheet	ct Number: 06	6120048	
DEDTH	ber Engineering	200					ş		G G	4 01 4	
(FT)	STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DA	TA	TESTS	REMARKS
				MH							
92.0 -	SILTY SAND, fi	ne to medium	grained,	SM	-7.0						
-	shell fragments	(30-40%), H0	to coarse Cl reaction								
-	moderate.						10	8+6+8 N =14			
_							_ ₉₅ _//	REC =1	8"		
-	-										
-	-										
_	gray, trace fine	to medium sh	ell				10	6+10+9			
100.0	fragments (2-5%	6), HCI react	ion weak.		-15.0		Ľ	N =19 REC =1	6"		
100.0	BOTTOM OF B	ORING @ 10	0.0 FT.		-13.0						
20/03											
N NOCHN											
GFJ											
& 400											
1 300											
50											
48 PL											
01210											
50											
E E E											
р Ц											

20	test and the second sec	alvert C alvert C	liffs Nucle ounty, Ma	ar Pow ryland	/er Pla	nt	Boring Contra	Number: ct Numbe	er: 061200	B-326
Schha	bei Engineering EOG					~	Sneet:	1 01 4		
Boring (Contractor: UNI-TECH DRILLING				1	Grou	undwater Obs	ervations		
	MALAGA, NEW JERSEY	-				Da	te Time	Depth	Casing	Caved
Boring F Drilling	F oreman: J. Blemings Method: Mud Rotary	-	Enco	untere	d	5/-	4	13.5'		
Drilling	Equipment: CME-750 (ATV)									
Schnab	el Representative: K. Megginson	Γ								
Dates	Started: 5/4/06 Finished: 5/4/06	F								
Location	n: Northing: 216859.22 ft Easting: 960652.25 ft	ŀ								
Ground	Surface Elevation: 103.1 (feet)	F								
DEPTH (FT)	STRATA DESCRIPTION	CLAS	S. ELEV. (FT)	WL	DEP	SA TH	MPLING DATA	TEST	S F	REMARKS
0.5	Forest litter, rootmat and topsoil.	05.0	102.6			MZ	2+2+2			
-	POORLY GRADED SAND WITH SILT, fine to medium grained, moist, light brown, contains root fragments.	SP-SI	M			╢╏	N =4 REC =18"			
-	fine to coarse grained.				- ,		3+2+4 N =6 2EC =13"			
_	fine to modium arginal stratified light				- 5 -			w=8.2	%	
-	brown and light orangeish brown.						N =7 REC =11"	*		
-	fine to coarse grained, yellowish brown and grayish brown, trace fine gravel. fine to medium grained, light orangeish brown below 8.5 ft.				- 10-		7+6+11 N =17 REC =11"			
-	fine to coarse grained.				-		10+9+10 N =19 REC =12"			
	fine to medium grained, wet, light yellowish brown.			Ţ	- - 15-		5+5+6 \ =11 REC =11"	w=12.2	%	
	orangeish brown and dark brown.				- - 20-		10+12+8 N =20 REC =10"			
23.5 	SILTY SAND, fine to coarse grained, wet, light orangeish brown and light grayish brown. <i>continued on next page</i>	SM			- - 25-		5+2+2 N =4 REC =16"	w=22.7 *	%	

	-	hpabol TEST	Project: Ca	alvert Cliffs	s Nucle	ar Pow	er Plant	E	Boring Number:	B-326
Sci	hna	bel Engineering LOG	Ca	alvert Cou	nty, Ma	ryland		C	Contract Number Sheet: 2 of 4	r: 06120048
DEP (FT	тн)	STRATA DESCRIPTIC	N	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLING	TESTS	REMARKS
28.		SANDY LEAN CLAY fine to m	edium	SM	74.6		 	2+1+2		
	-	wet, gray, contains silt pockets mica.	and	UL				N =3 REC =18	" 	*Shelby tube sampler push
	- -	moist, with sand.					 35 	REC =24	"	¹⁰ from 33.5 to 35.5 ft. tsf
38.	 -	FAT CLAY, moist, gray, trace f medium sand and mica.	îne to	СН	64.6			2+4+5 N =9 REC =18		*Shelby tube
43.4 80/9/E 10	5 _	ORGANIC CLAY, moist, gray, to medium sand and mica, con to medium clayey sand pockets	trace fine tains fine s.	OH	59.6		 45 	REC =24	" w=33.94 LL=63 PL=22 PP=2.25	samplér push from 43.5 to 45.5 ft. tsf
300 & 400.GPJ SCHNABEL.GL	5 - - -	FAT CLAY, moist, gray and lig trace fine to medium, mica and matter (±1%).	ht gray, I organic	СН	54.6		 - <u>50</u> -	4+6+8 N =14 REC =18		
NG LOG 06120048 PLOG SPT	5 - - -	SANDY LEAN CLAY, fine to m wet, gray, trace mica.	edium,	CL	49.6		 55 	REC =24	" PP=2.25	*Shelby tube sampler push from 53.5 to 55.5 ft.
TEST BOR		continued on next page								

		hashol TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Borir	g Number:	B-326
	Schnal	bel Engineering LOG	с	alvert Cou	nty, Ma	iryland		Cont	act Number: 0	6120048
	DEPTH	STRATA DESCRIPT		CLASS.	ELEV.	WL	S	AMPLING	TESTS	REMARKS
	0.0			CL	0.0		DEPTH	DATA	Challenger 190 195 14 199	
	-				12.6		M	17+8+28 N =36	PP=2.00 tsf	
	- 59.5	SILTY SAND, fine to medium moist, gray, trace mica, conta cemented sand pockets.	ı grained, ains	SM	43.0		0[\] 	REC =16"		
	_									
	63.5 -	POORLY GRADED SAND W fine to medium grained, mois	/ITH SILT, t, gray	SP-SM	39.6			50/3" N =50/3" REC =1"		
	-									
	-									
	68.5	SILTY SAND, fine to medium	grained,	SM	34.6			50/5"		
	_	wet, gray, trace fine to mediu fragments (±<5%), strong HC	m shell I reaction	92090.075250			_70_	N =50/5" REC =1"		
	-									
	-									
	_	little fine to coarse shall fragm	nente					19+24+23		
	-	(±25%), contains clayey sand	d pockets.					N =47 REC =12"		
	-									
	-									
	_							50(2)		*Rotary
5/08	-	cemented sand, weak HCl re	action.					N =50/3" REC =4"		advancement considerably slower below
GDT 3/6	-									78.5 ft (Moderately
NABEL.	-									advancement).
PJ SCH	-									advancement comparatively
\$ 400.GF	_	wet, oliveish gray and gray, to coarse shell fragments (±5%) HCI reaction	race fine to), strong				M	23+13+50/4" N =63/10" REC =14"		to 83 ft; moderately
PT 300 §							-85-			difficult rotary advancement
PLOG SI	_									
1200481	- 89 5				146					3-7/8" 0.D. Tri-cone roller
RING LOG 06:		CLAYEY SAND, fine to medi grained, wet, gray, trace fine shell fragments (±5%), strong reaction.	um to coarse g HCl	SC	14.0			9+7+12 N =19 REC =18"		bit below 88 ft.
FEST BO	_	continued on next pag	je							

48

Schnal	TEST Project: C bel Engineering LOG C	alvert Cli alvert Co	ffs Nucle ounty, Ma	ar Pow ryland	/er Pla	nt		Boring Contra Sheet:	Number: Ict Number 1 of 5	er: 061200	B-327
Boring C						Gro	oundw	ater Obs	ervations		
Boning C	FREDERICK, MARYLAND	, INC.				D	ate	Time	Depth	Casing	Caved
Boring F	oreman: D. Bender		Enco	untere	d	5	/25		28.0'		
Drilling	Method: Mud Rotary		Start	of day	y	5	/26		38.0'		
Drilling E	Equipment: CME-550	-									
Schnabe	el Representative: K. Bell										
Dates \$	Started: 5/25/06 Finished: 5/26/06										
Location	: Northing: 216865.7 ft Easting: 960573.37 ft										
Ground	Surface Elevation: 86.9 (feet)										
DEPTH (FT)	STRATA DESCRIPTION	CLASS	. ELEV. (FT)	WL	DEP	S/ TH	AMPLI D	ING ATA	TEST	S F	REMARKS
0.5	ROOTMAT AND TOPSOIL.		86.4								
-	SILTY SAND, fine to coarse grained, moist, brown and yellowish brown, trace	SM			-	-M	2+3+3 N =6	3 =11"			
2.0 -	root fragments.	SP-SM	84.9		-	믭	NEO.	-11			
	POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, vellowish					-M	2+3+3	3			
_	brown and orangeish brown, trace root					LΜ	REC	=3"			
4.5	fragments.	SC.	82.4		_						
_	moist, orangeish brown and reddish				F 5 -	M	3+5+6	6			
	brown, trace root fragments.				- 1	-W	N =11	=12"			
70 -			79.9				NLO.	-12			
7.0	SILTY SAND, fine to medium grained,	SM	10.0				5+4+1	2			
-	molst, orangeish brown and gray.				- 1	IXI	5+4+、 N =7	5			
-					-	-121	REC	=18"			
					L10-						
							37.07	1			
-					-	IXI	N =3	1			
-					-	-121	REC	=18"			
13.0 -			73.9								
3	CLAYEY SAND, fine to medium	SC	10.0				3111	2			
5 –	grained, moist, gray.				-	IXI	N =7	2			
					-15-		REC	=17"			
					L						
5 17.0 -	SANDY LEAN CLAY, moist, gray.	CL	69.9		F 1	1					
-	.04 .05				F I	-					
f 5 _					L	-M	2+3+3	3			
						Ň	N =6	-18"			
5 —					-20-		NLO.	-10			
<u> </u>					-	+					
220 -			649		L						
22.0	SILTY SAND, fine to medium grained,	SM	07.0								
	moloc, gray and light gray.				F	ᆌ_					
- -						-M	3+3+4 N =7	4			
_					-25-	$ \Delta $	REC	=18"			
	continued on next page										
۲ ـــــ											

		hnabol	TEST	Project: C	alvert Cliffs	s Nucle	ar Pow	er Plant	Bori	ng Number:	B-327
	Schna	bel Engineering	Ci	alvert Cou	nty, Ma	ryland		Cont Shee	ract Number: 0 et: 2 of 5	6120048	
	DEPTH (FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S/ DEPTH	AMPLING DATA	TESTS	REMARKS
	- - - - -				SM		Ā	 30 - 	4+5+5 N =10 REC =18"		
		FAT CLAY, moist,	light gray,	trace sand.	СН	55.9		 	5+6+4 N =10 REC =18"		
	37.0 - - - -	SANDY SILT, moi gray.	ist, greenisł	gray and	ML	49.9		 - 40-	4+4+5 N =9 REC =16"		
- 3/6/08	- 43.0 - - - -	SILTY SAND, fine moist, gray and w medium shell frag reaction weak. trace fine to mediu >5%, HCI reaction structure.	to medium hite, trace fi ments, 15-2 um shell fra, n weak, pla	grained, ne to 25%, HCI gments, tty	SM	43.9		 	27+50 N =50 REC =12"		Harder drilling Rig chatter
8 PLOG SPT 300 & 400.GPJ SCHNABEL.GD1	- - - -							 X 50 - X	13+50 N =50 REC =11" 50/5" N =50/5"		
TEST BORING LOG 0612004		SANDY LEAN CL greenish gray, trac continued	AY, moist, g ce fine to m d on next pag	gray and edium e	CL	29.9		55 	KEC =5"		

ſ		hashol TEST	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant	Borin	g Number:	B-327
	Schna	bel Engineering LOG	Ci	alvert Cou	nty, Ma	ryland		Contr Sheet	actNumber:0 :3 of 5	6120048
Ī	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	SA DEPTH	MPLING DATA	TESTS	REMARKS
	-	shell fragments, 2-5%, HCl r weak.	eaction	CL			 	4+4+7 N =11 REC =18''		Rig chatter
	62.0 - - - - -	SILTY SAND, fine to medium moist, greenish gray and gray to medium shell fragments, 2 cementation, HCI reaction str	grained, y, trace fine -5, ong.	SM	24.9		 [23 + 65 	50/4" N =50/4" REC =2"		
	- - - -	wet, trace fine to coarse shell fragments, 20-30%, HCl read moderate.	ction				 	5+5+7 N =12 REC =18"		
					99		 75-	7+8+8 N =16 REC =17"		Rig chatter
NABEL.GDT 3/6/08		ELASTIC SILT wet, greenish fine to medium shell fragmen HCI reaction weak.	gray, trace ts, 2-5%,	MH	0.0		 - 80	5+5+8 N =13 REC =16"		
LOG SPT 300 & 400.GPJ SCH	- - - 87.0 -				-0.1		 	4+4+8 N =12 REC =18"		
ORING LOG 06120048 P.	-	SILTY SAND, fine to medium wet, greenish gray, trace fine shell fragments, 20-30%, HC moderate.	grained, to coarse I reaction	SM			 M	4+8+12 N =20 REC =17"		
TEST B	-	continued on next pag	1e							

	hnahal	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-327	
Schna	Schnabel Engineering LOG				nty, Ma	ryland		Ī	Contra Sheet	ct Number: 00	6120048
DEPTH	ber Engineering				FLEV		s		G	4 01 5	
(FT)	STRATA DE	SCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DA	TA	TESTS	REMARKS
				SM							Rig chatter
-											
-											
-	fine to coarse grained	d, light gi	ray and				17	20+17+	13		
_	fragments, 50-60%,	strong					_ ₉₅ _	REC =1	8"		
	cementation, HCI rea	action sti	rong.								Dia shetter
											Rig chatter
-											
-											
-							10	6+15+1 N =33	8		
_							_100_/\	REC =1	6"		
-											
_											
-											
-							10	6+12+1 N =31	9		
_							-105-M	REC =1	8"		
=											
107.0 -		00 14			-20.1						
	FAT CLAY, wet, gree fine to medium shell	enish gra fragment	y, trace ts, 2-5%,	СН							
	HCI reaction weak.	Ũ	noo / omer onedplot					5+7+12			
-							X	N =19			
-							-110-1/	REC =1	8		
-											
-											
- (9)											
0 L								REC =9)" 	w=44.3%	
ELIG BELIG										LL=60 PL=24	
HNAE							-115-			PP=>4.5 tsf	
- 20											
- 00.6											
- 08 4											
02 L								5+7+11			
00 81							$\ $	N =18 REC =1	8"		
							-120-1		~		
- 1200	-										
ຶ <mark>ຼ</mark> 122.0 -	SILTY SAND fine to	coarse	rained	SM	-35.1						
- Q	wet, light gray and w	hite, trac	e fine to								
SORIF	cementation, HCl rea	action str	ong.					50/3"			
ESTE	continued or	n next pag	e								
-											

	hnabal	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-327	
Schnal	Schnabel Engineering LOG				inty, Ma	iryland			Contrac Sheet:	t Number: 06 5 of 5	6120048
DEPTH (FT)	STRAT	TA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	ہ DEPTH	SAMPLIN	G TA	TESTS	REMARKS
_				SM			_125_	N =50/3 REC =2	3" <u>2</u> "		
-											
-											
											Resumed drilling on
							\	5+7+11 N =18			5/26/Ŏ6 @ 7:20am
-							- <u>1</u> 30-	REC =C)"		
_											
-	fine to medium	grained, mois	t, greenish Jedium				17	5+6+11 N =17			
-	shell fragments weak.	s, 2-5%, HCI r	eaction				/	REC =1	18"		
-											
-											
_								REC =1	10"	PP=>4.5 tsf	
_							140				
-											
	trace fine to me	edium shell fra	aments.					3+5+7			
_	5-10%, HCI rea	action weak.	5 ,				[_ ₁₄₅][N =12 REC =1	18"		
- 0000											
- en											
					02.1			N =17 REC =1	8"		
500.0 — 8	BOTTOM OF E	30RING @ 15	0.0 FT.		-63.1						
0120040											

	-	hnabel TEST	Project: C	alvert (Cliffs	Nucle	ar Pow	er Plai	nt		Boring	Number:		B-328
Se	chnat	bel Engineering LOG	alvert (Cour	nty, Ma	ryland				Contra Sheet:	ct Numbe 1 of 5	er: 06120	048	
Bor	ing C	ontractor: CONNELLY AND	, INC.					Gro	oundv	vater Obs	ervations	r	,	
Bar	ine F	FREDERICK, MAR	RYLAND						D	ate	Time	Depth	Casing	Caved
Bor	ling F	lethod: Mud Rotary				Enco	untere	d	6	/19		9.0'		
Dril	lina F	Equipment: CME-550				Start	of day	(6	/20		9.0'		
Sch	nabe	I Representative: K. Bell												
Date	es S	Started: 6/19/06 Finished:	6/20/06											
Loc	Location: Northing: 216828.86 ft Easting: 960493.21 ft													
Gro	und \$	Surface Elevation: 76.3 (feet)												
DEI (F	РТН Т)	STRATA DESCRIPT	ION	CLAS	SS.	ELEV. (FT)	WL	DEP	S/ TH	AMPL [ING DATA	TEST	S I	REMARKS
0	.2	ROOTMAT AND TOPSOIL.	/	SP-S	SM	76.1			M	2+1+	2			
	-	POORLY GRADED SAND W fine to medium grained, mois brown, trace root fragments.	/ITH SILT, t, yellowish						ĬŴ	N =3 REC	=16"			
	-								-M	2+2+ N =6	4	w=4.59 LL=NF	% >	
						74.0				REC	=15"	PL=NI *	>	
4	.5 _	SANDY LEAN CLAY, moist,	orangeish agments	CL		71.8		- 5 -		2+3+	3			
	-		.g						-W	N =6 REC	=18"			
7	.0 -	SANDY FAT CLAY trace on	ad wat			69.3			-					
	_	gray.	iu, wei,		'				-M	2+2+	2	w=30%	6	
	_						$\overline{\Delta}$		$ \Delta $	REC	=18"			
	_									3+3+	4	w=28.8	% sta	rt of mud ary drilling
									Ň	N =7 REC	=18"	LL=59 PL=17	7	
								ſ.				*		or chapge in
13	.0 –	FAT CLAY, trace sand, moist	, gray.			63.3		- ·		2+3+	л		mu	d tub from
10/0	_								٦XI	N =7	4 _10"		bro	own to gray
בריפר	-							-15-		REU	-10			
INABI	-								+					
	-								+					
19.00						F7 0			+					
* 18 × ∩	.5 -	ELASTIC SILT, gray		M⊢	ł	57.8			-0	5+4+	6	w=35.1 LL=64	% 1	
1 1 1 1	_							-20-	M	REC	=18"	PL=36	5	
,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	_							L.						
1048 P								L.						
17100	_													
ථි 23	.5	FAT CLAY dark green		СН	$\left \right $	52.8		Ľ,		4+6+	9	w=33%	6	
DNING	-	The series and groom								N =1	5	LL=77 PL=28	3	
ol BC	—	continued on next pag	je					-25-		NEU	-10			
<u> </u>														

	6	hashol TEST	Project: C	Calvert Cliffs Nuclear Power Plant Calvert County, Maryland					Boring Number: 06120048	
	Schnat	bel Engineering LOG	C C	alvert Cou	nty, Ma	iryland		C	ontract Number: (heet: 2 of 5	06120048
	DEPTH (FT)	STRATA DESCRIPT	TION	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLING	TESTS	REMARKS
	- 27.0	CLAYEY SAND, contains sh	ells, moist,	CH SC	49.3				*	
	-						 	7+9+14 N =23 REC =18"	w=30.5% LL=40 PL=21 *	Harder drilling
	32.0 - - - -	POORLY GRADED SAND W fine to medium grained, wet, contains fine to coarse shell 30-40%, HCl reaction strong	/ITH SILT, gray, fragments,	SP-SM	44.3		 35 	33+34+50 N =84/10" REC =16"	//4" w=18.2%	
	-						 	50/4" N =50/4" REC =4"	w=22.6%	
~	-	gray and white, with fine to c fragments, 50-60%.	oarse shell				 45	3+15+10 N =25 REC =18"	w=24.2% LL=NP PL=NP *	
400.GPJ SCHNABEL.GDT 3/6/06	47.0 - - - -	CLAYEY SILT, moist, greenis strong cementation, HCI read strong.	sh gray, tion	ML	29.3		 - 50- 	10+15+50 N =65/7" REC =12"	y1" w=25.8%	harder drilling/ heavy rig
DG 06120048 PLOG SPT 300 &	52.0 - - - -	SILTY SAND, fine to medium wet, greenish gray, contains coarse shell fragments, 25-3 reaction strong.	n grained, fine to 5% , HCl	SM	24.3		 - <u>55</u> -	5+5+21 N =26 REC =18"	w=24% *	
TEST BORING L	-	continued on next pag	ge							Rig chatter

Comments:

	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	Bor	Boring Number: B-32		
Schnal	bel Engineering LOG	i	Calvert Cou	nty, Ma	iryland		Con She	tract Number: 0 et: 3 of 5	6120048
DEPTH (FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLING	TESTS	REMARKS
-	-		SM				5+5+8 N =13 REC =18"		
61.0 - -	ORGANIC SILT, wet, greeni contains fine to coarse shell 25-35%, HCl reaction, strong	sh gray, fragments, J.	ОН	15.3					
-						 65 	REC =24"	w=44.2% LL=72 PL=41 *	
67.0 - - - -	SILTY SAND, fine to mediun wet, greenish gray, trace fine shell fragments, 2-5%, HCI weak.	n grained, to medium reaction	SM	9.3		 	4+6+9 N =15 REC =18"	w=29.4% LL=NP PL=NP *	
						 	4+4+7 N =11 REC =18"	w=32.2% LL=NP PL=NP *	
- - 8000 - 9000 - 9000	greenish gray and white, witl coarse shell fragments, 50-6 cementation, HCl reaction st	n fine to 0%, strong rong.				 	8+18+28 N =46 REC =18"		Rig chatter
- - 85.0 — -	contains fine to coarse shell 30-40% SANDY ELASTIC SILT, gree	fragments, en	MH	-8.7		 	8+16+50/5" N =66/11" REC =16"	w=21.2% LL=NP PL=NP *	Rig chatter
	continued on next pa	ge				 	9+10+16 N =26 REC =18"	w=34% LL=47 PL=31 *	

00000

	hnabol	Project:	Calvert Cliffs Nuclear Power Plant Calvert County, Maryland					Boring Number: B-32 Contract Number: 06120048		
Schna	abel Engineering	LOG		Calvert Cou	inty, Ma	iryland		Co	ontract Number: 06 neet: 4 of 5	6120048
DEPTH (FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S/ DEPTH	AMPLING DATA	TESTS	REMARKS
				MH			 -95 	REC =13" 5+6+12	w=38.2%	
- 102.0	SILTY SAND, wet	;, greenish <u>c</u>	gray, trace	SM	25.7		₁₀₀ Ŭ 	N =18 REC =18"	PL=33 PL=34	softer drilling
- - -	fine to medium sh HCI reaction weak	ell fragmen	is, 2-5%,				 	6+9+12 N =21 REC =18"	w=62.7%	
-	-				0.5.7		 _ ₁₁₀	5+8+13 N =21 REC =18"		Resumed drilling on 6/20/06 @ 7:30am
	SANDY ELASTIC grained, wet, gree fine to coarse she HCI reaction stron	SILT, fine t enish gray, c Il fragments ig.	o medium contains 6, 20-30%,	MH			 115-	6+7+14 N =21 REC =18"	w=30.5% *	
	ELASTIC SILT, m trace fine to mediu 5-10%, HCI react	oist, greeni um shell fra ion weak.	sh gray, gments,	MH	1-40.7		 -120- 	5+6+8 N =14 REC =18"	w=44.7% *	softer drilling
	continuec	d on next pag	e					REC =11"	w=45.6%	

	TEST Project: C					ar Pow	er Plant		Boring	B-328	
Schnal	Schnabel Engineering LOG				nty, Ma	iryland			Contract Number: 06120048 Sheet: 5 of 5		
DEPTH				CLASS, ELEV. WI					G	TESTS	RFMARKS
(FT)		DEGOINT			(FT)		DEPTH	DA	ТА	11=72	
_										PL=45 PP=>4.5 tsf	
_										*	
_											
	oliveish arav							5+7+10			
-	5 <u>9</u> ,							N =17 REC =1	8"		
									0		
-											
<u> </u>							IX	6+6+9 N =15		W=46.2% LL=70	
							- <u>135</u> -1/1	REC =1	8"	PL=51 *	
-											
-							17	6+7+9			
_							L_140-10	REC =1	8"		
_											
_											
								5+7+8		w=59.3%	
							Г <u></u> ТХ	N =15 RFC =1	8"	*	
80							-145		-		
- 3/6											
- EL.GD											
HNAB										w-74 8%	
- sc							F -1X	6+8+11 N =19		LL=134	
¹⁰ . 150.0 —	BOTTOM OF B	ORING @ 15	0.0 FT.	1	-73.7		-150-L	REC =1	8"	*	
2008											
PLOC											
20048											
001											
la Lo											
BORIF											
ES											

	Sc	hnabel BORING	Project:	Calvert Calvert	Cliffs Cou	s Nuclea ntv. Ma	ar Pow rvland	er Plai	nt		Boring	Number:		B-329	
-	Schnabel Engineering LOG										Sheet:	Sheet: 1 of 4			
в	oring C	Contractor: CONNELLY AND		ES, INC.				1	Gro D	oundv ate	vater Obs	ervations Denth	Casing	Caved	
в	oring F	oreman: D. Bender	Encountered 6/13				33.5'								
D	rilling N	Method: Mud Rotary	Start of day 6/14				28.0'								
D	rilling E	Equipment: CME-550		Otari			0	45		20.0					
S	chnabe	Representative: K. Bell			Start	of Day	/	6	/15		30.0				
	ocation	: Northing: 216800.38 ft													
		Easting: 960379.43 ft													
G	iround \$	Surface Elevation: 74.8 (feet)													
)EPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLAS	SS.	ELEV. (FT)	WL	DEP	S/ TH	AMPL [.ING DATA	TEST	s	REMARKS	
	0.5	ROOTMAT AND TOPSOIL.		SP-8	SM	74.3		L .	Π	2+2+	2				
	-	fine to coarse grained, moist brown, trace root fragments.	, yellowish			70.0			W	N =4 REC	=5"				
	2.5	CLAYEY SAND, fine to medi grained, moist, orangeish bro	ium own.	sc	2	72.3			-0	3+4+ N =8	4				
	- 4.5	SILTY SAND find to modium	aroinod		_	70.3				REC	-10				
	_	moist, orangeish brown.	i grained,		/1			- 5 -		3+4+ N =8	4				
	70 -					67.8		L .		REC	=18"				
	-	SANDY FAT CLAY, moist, g	ray.	CF	1	01.0		L .	M	3+3+	3				
	_								Ň	N =6 REC	=18"				
	_							-10-							
	_								M	1+4+	6				
	-								Ш	N =10 REC) =18"				
	_								$\left \right $						
00/0/0	-								-M	2+3+	3				
eni	_							-15-	M	REC	=18"		So	fter drilling	
NABEL	-							L .					55991757	Ŭ	
II N	17.0 -		olot arev		-	57.8									
JU.GPJ	_	ELASTIC SILT WILL SAND, MO	usi, yray.		1										
JU & 4L	_							L .	-M	3+4+	5				
271 31	_							-20-	M	REC	=18"				
FOG	-														
20048	22.0 -			-		52.8		L .							
100 5	-	SANDY SILT, MOIST, gray.			-			L .	-M	4+6+	8				
6 10	_							L .	<u> </u> M	REC	+ =18"				
BUKIN	_							-25-							
2		continued on next pag	ge												

		TEST Project: Calvert Cliffs Nuclear Power Plant							Boring Numb	B-329	
	Schna	bel Engineering LOG	eering LOG Calvert County, Maryla					Contract Number: 06120 Sheet: 2 of 4			
	DEPTH (FT)	STRATA DESCRIPTION		CLASS. ELEV. WL SAW			AMPLING		STS	REMARKS	
	-			ML			 30 -	5+8+13 N =21 REC =18			
	32.0 - - - - -	SILTY SAND, fine to medium wet, light gray.	ı grained,	SM	42.8	Ā	 	13+27+3: N =60 REC =18	3		
	- - 42.0 -	gray and white, contains fine shell fragments, 10-20%, HC moderate CLAYEY SILT, moist, gray, t medium shell fragments, 2-5 reaction weak.	to medium Cl reaction race fine to %, HCl	ML	· 32.8			18+21+3 N =52 REC =13	1		
GDT 3/6/08	- - 47.0 -	SILTY SAND, fine to coarse wet, gray, with fine to coarse	grained, shell	SM	· 27.8		 	3+4+6 N =10 REC =18			Rig chatter
- 300 & 400.GPJ SCHNABEL.(- - 52.0 -	CLAYEY SAND, fine to medi	um	SC	· 22.8		⊠ 50 	50/4" N =50/4" REC =2"			
RING LOG 06120048 PLOG SPI	- - - 57.0 -	SILTY SAND, fine to medium	rong.	SM	• 17.8		 <u>55</u>	11+30+3 N =63 REC =17	3		
TEST BOF	-	wet, greenish gray, contains continued on next pag	ge								

ſ	-	TEST Project: Ca				ar Pow	er Plant		Boring	B-329		
	2C	BORING C		Calvert Cou	alvert County, Maryland					Contract Number: 06120048		
ŀ	Schnat	bei Engineering LOG	1						3 01 4			
	DEPTH (FT)	STRATA DESCRIPTION		CLASS.				G	TESTS	REMARKS		
ŀ	• •	coarse shell fragments, 20-	SM			DEPTH						
	-	reaction moderate.				∏	4+5+6					
							L_{m}	REC =1	8"			
	-						- 1					
	-											
	-											
	_							REC =2	2"			
							CE.					
											Resumed	
	-										6/14/06 @	
	-										7:00am	
	-											
	_							5+5+10				
							I _a IX	N =15 REC =1	8"			
	_								-			
	-											
	-											
	-											
	_							REC =2	4"			
							76					
							/5 _					
	-											
	-											
	-											
	_	with fine to coarse shell frag	gments,					50/3"				
/08		60-70%, strong cementation reaction strong	on, HCI					N =50/3	u u			
T 3/6	_						-80-					
L.GD	-										Rig chatter	
NABE	-											
SCH	-											
GPJ		contains fine to coarse she	ll fragments,					14+50				
\$ 400	~~	30-40%						N =50	0"			
300 8	_						-85-		-			
SPT SPT	-											
PLOG	87.0 -	CLAYEY SAND fine to mo	dium	90	-12.2							
0048	_	grained, wet, greenish gray	, trace fine to				$ \downarrow \downarrow$				Resumed	
0612		reaction moderate.	10%, HCl					10+12+:	24		arilling on6/15/06 @	
DOG							I _ IĂ	N =36	8"		7:00am -	
RING	-						-90-1 ⁻¹		-			
T BO	-	continued on next r	age									
TES			C 101									