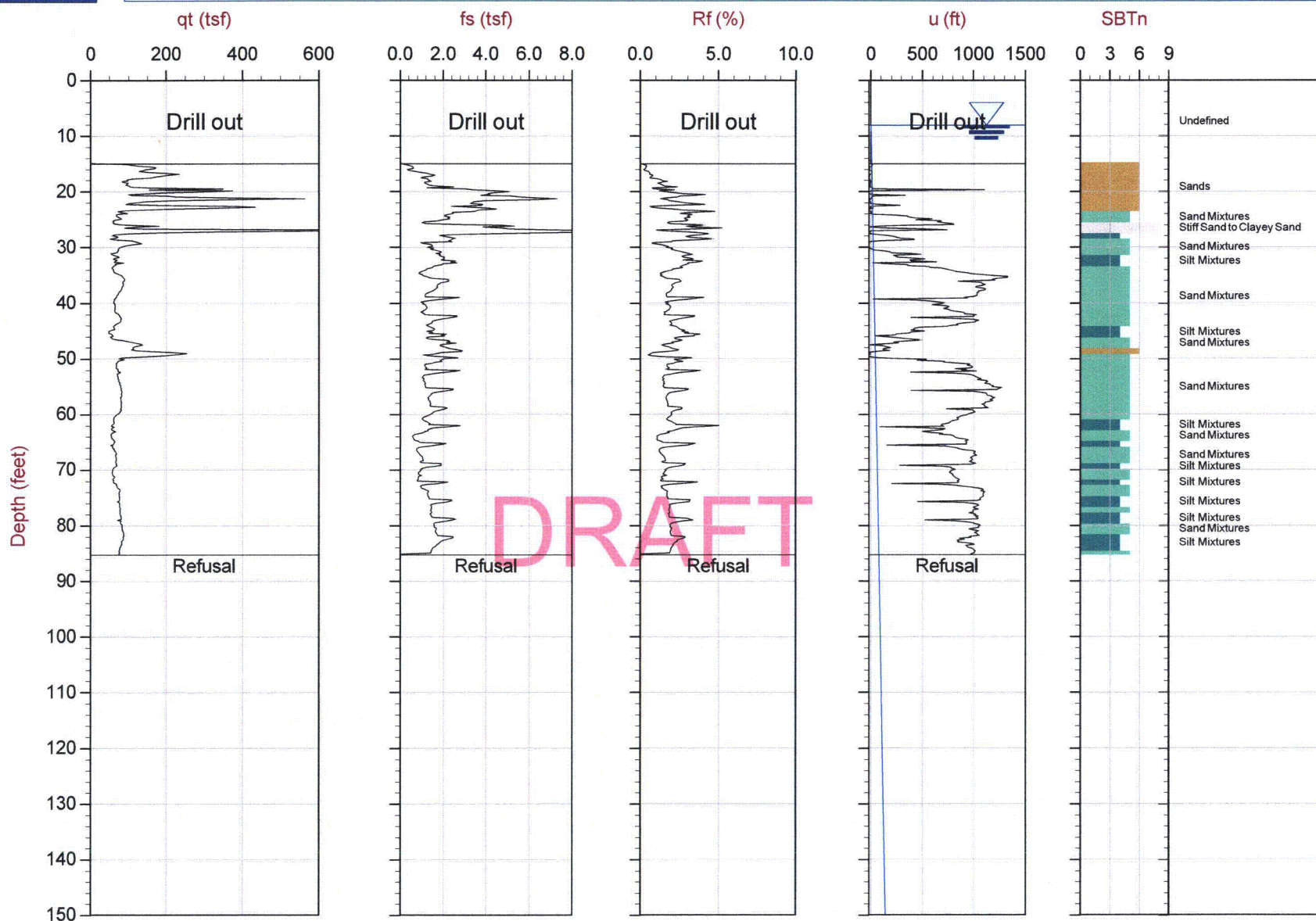


Draft CPT Logs

- Draft CPT Logs -

- Draft Pore Pressure Dissipation Records -

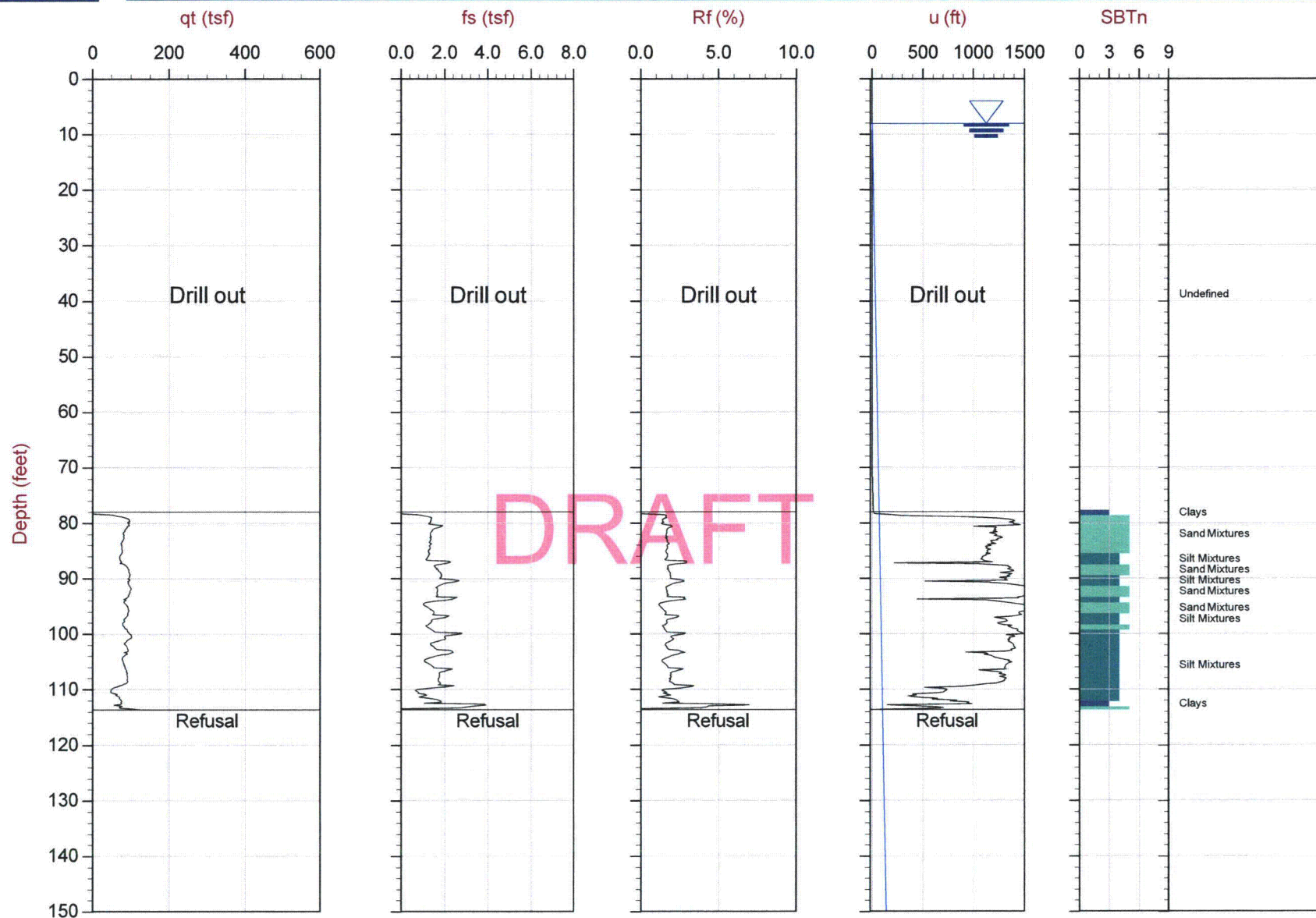
- Draft CPT Logs -



Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

File: 965CP17.COR
Unit Wt: SBT Chart Soil Zones

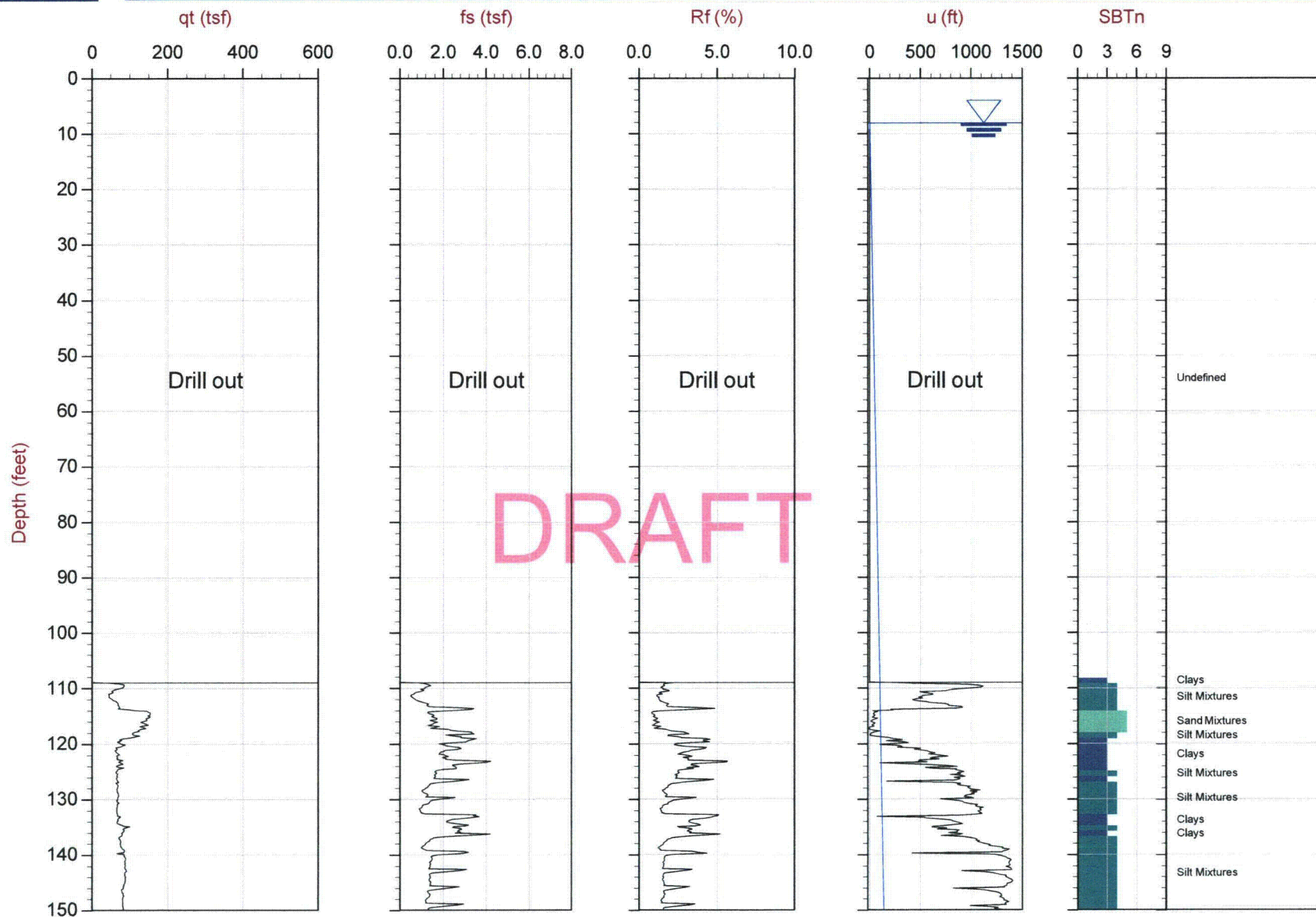
SBT: Lunne, Robertson and Powell, 1997
Page No: 1 of 1



Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

File: 965CP18.COR
Unit Wt: SBT Chart Soil Zones

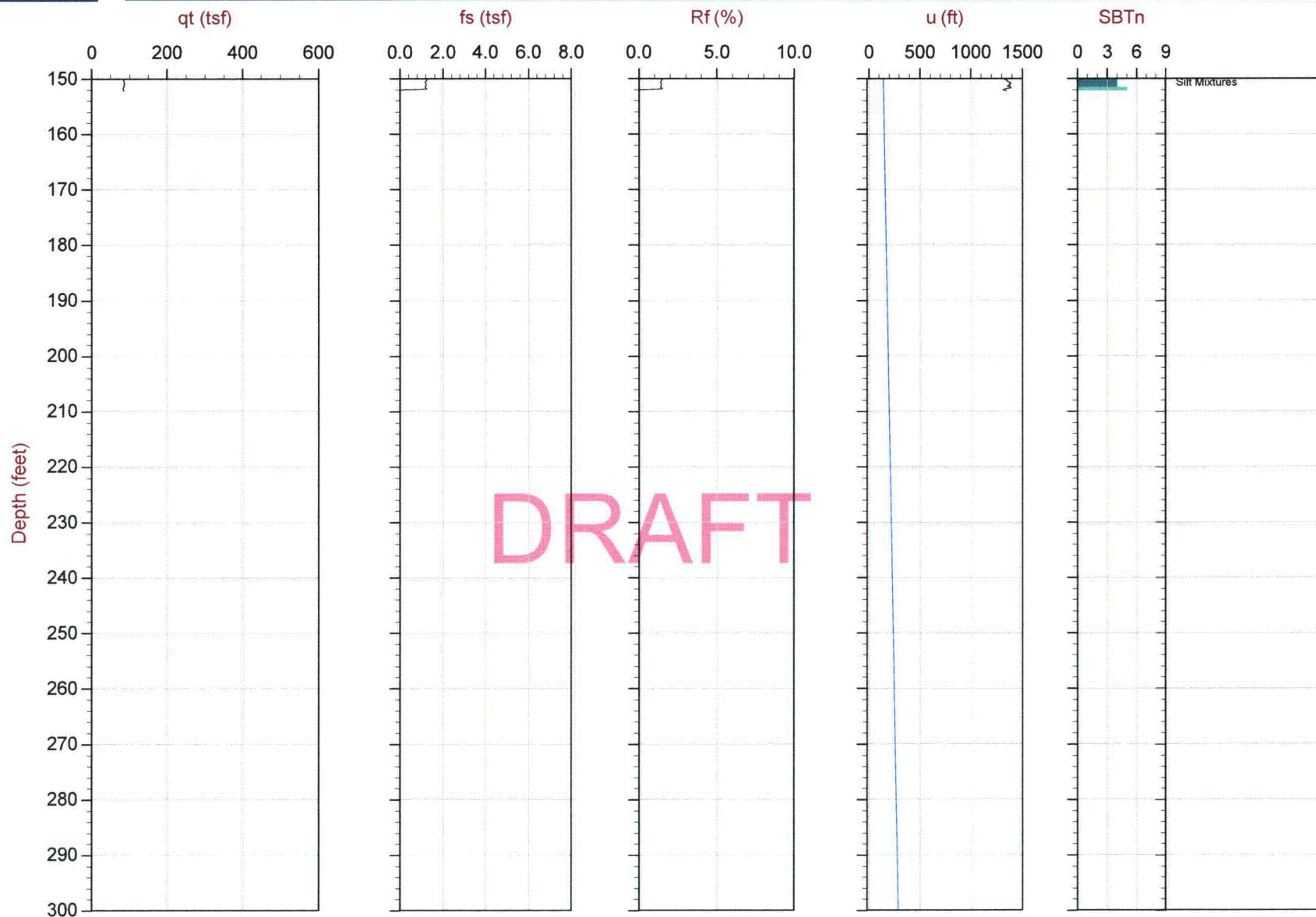
SBT: Lunne, Robertson and Powell, 1997
Page No: 1 of 1



Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

File: 965CP19.COR
Unit Wt: SBT Chart Soil Zones

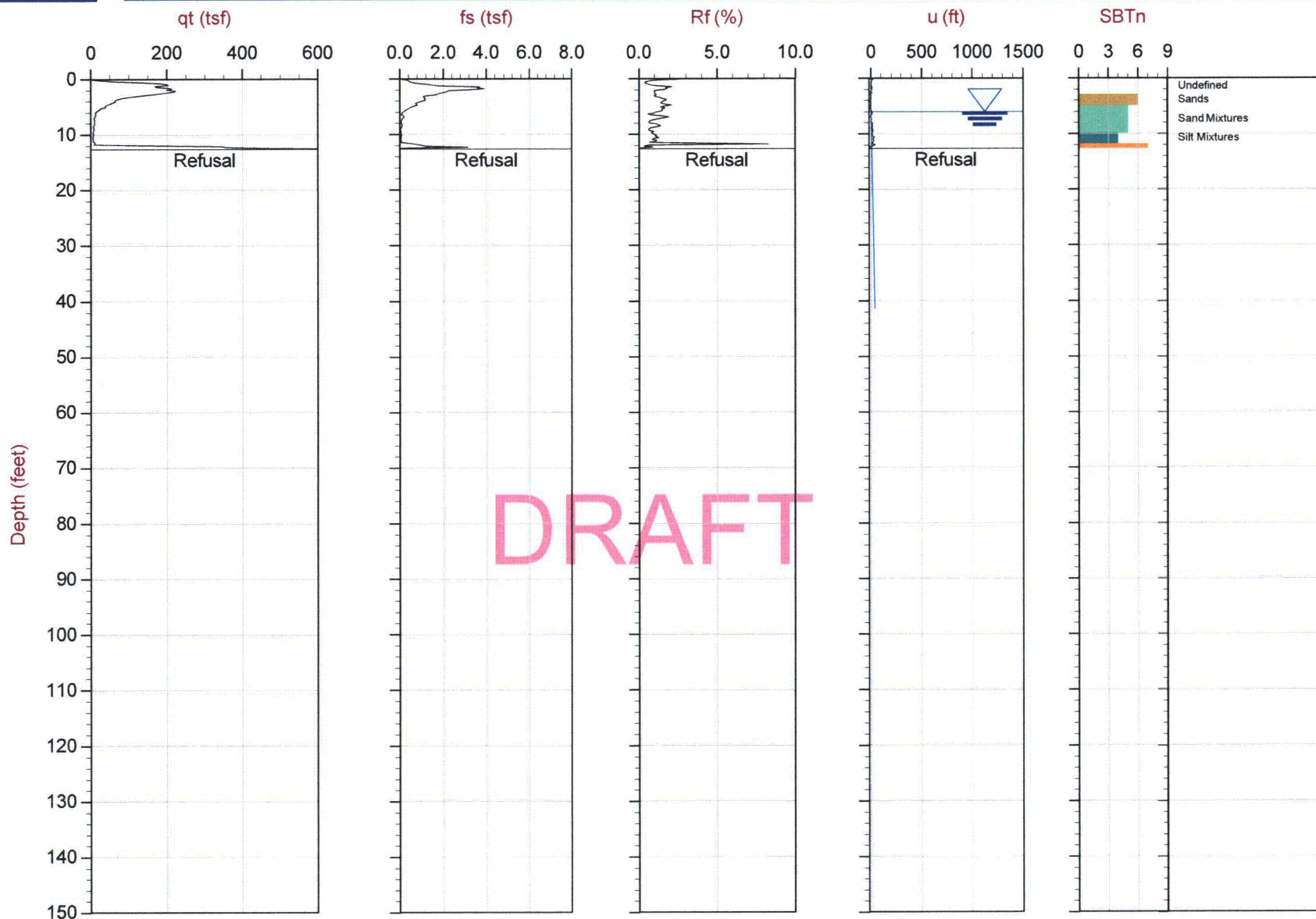
SBT: Lunne, Robertson and Powell, 1997
Page No: 1 of 2



Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

File: 965CP19.COR
Unit Wt: SBT Chart Soil Zones

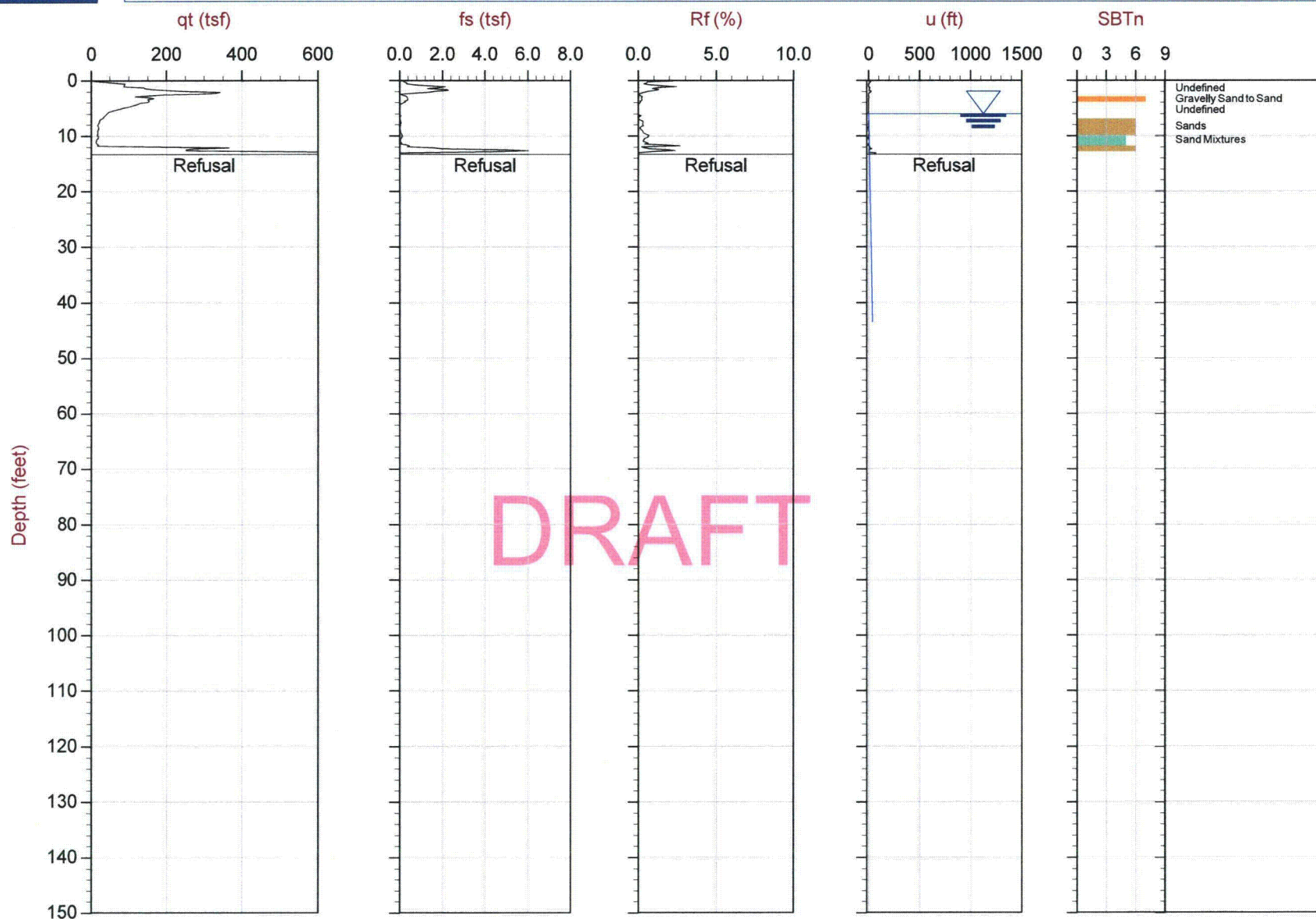
SBT: Lunne, Robertson and Powell, 1997
Page No: 2 of 2



Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

File: 965CP14.COR
Unit Wt: SBT Chart Soil Zones

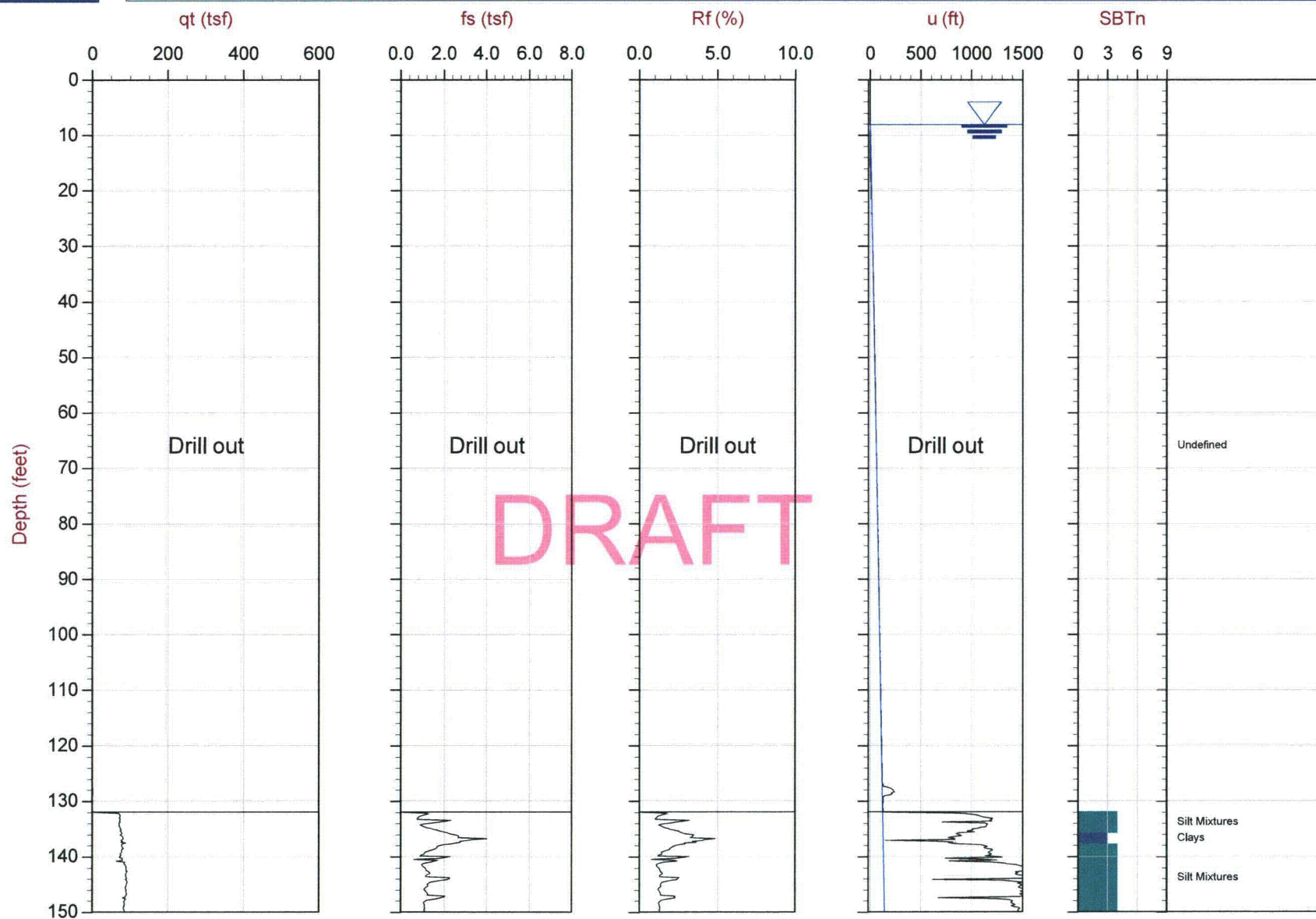
SBT: Lunne, Robertson and Powell, 1997
Page No: 1 of 1



Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

File: 965CP10.COR
Unit Wt: SBT Chart Soil Zones

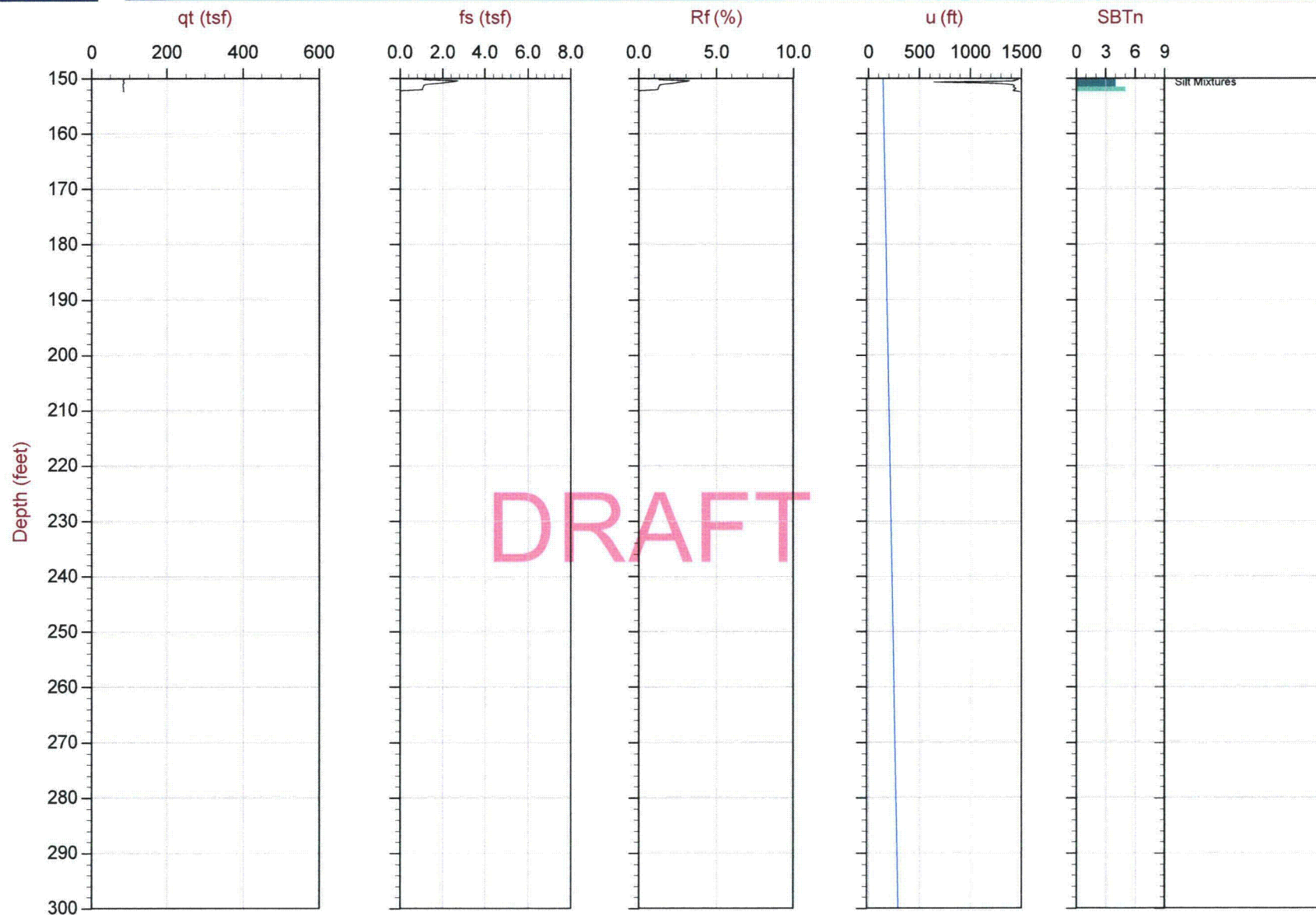
SBT: Lunne, Robertson and Powell, 1997
Page No: 1 of 1



Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

File: 965CP16.COR
Unit Wt: SBT Chart Soil Zones

SBT: Lunne, Robertson and Powell, 1997
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Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

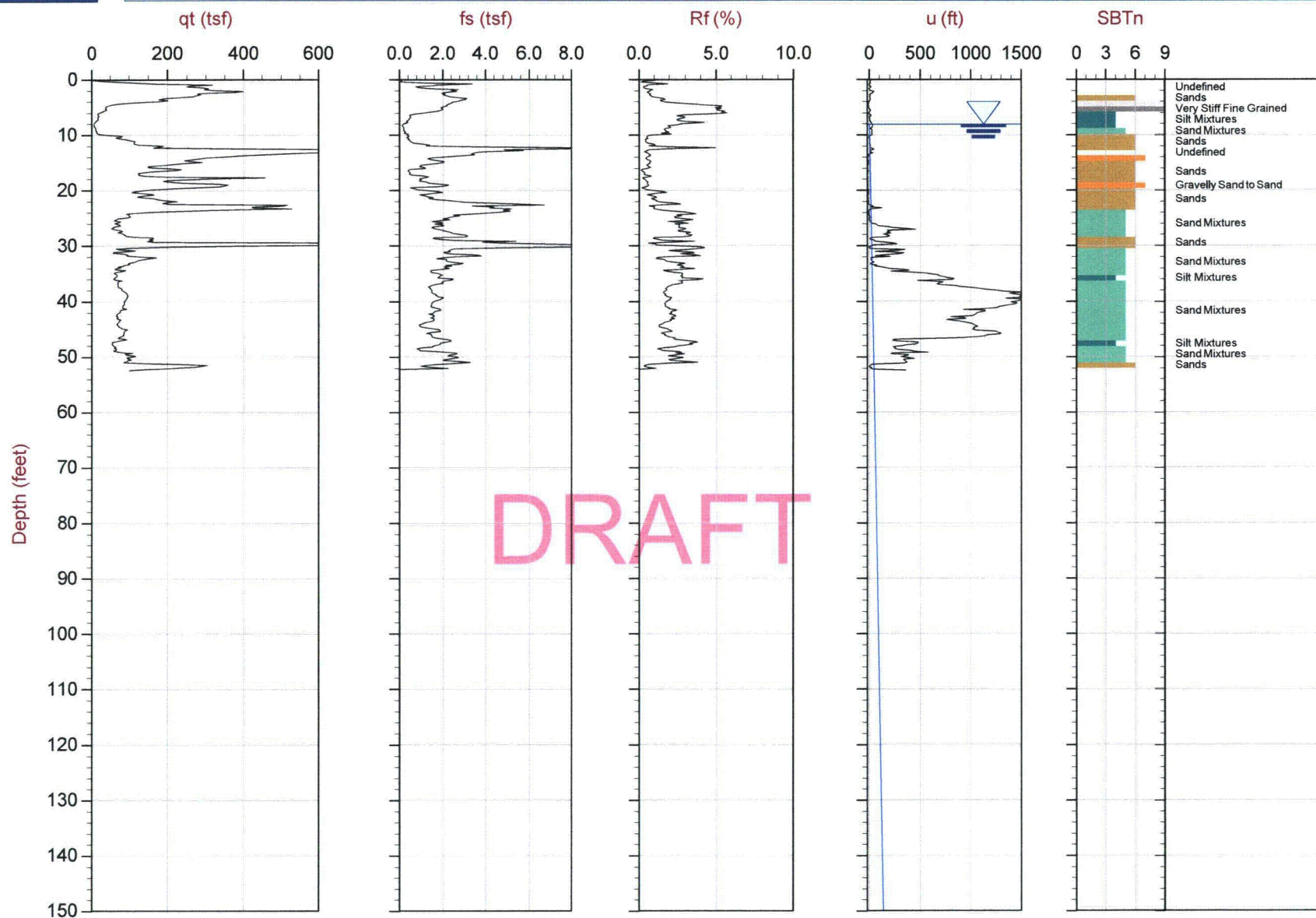
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Unit Wt: SBT Chart Soil Zones

SBT: Lunne, Robertson and Powell, 1997
Page No: 2 of 2



Site: CCNPP

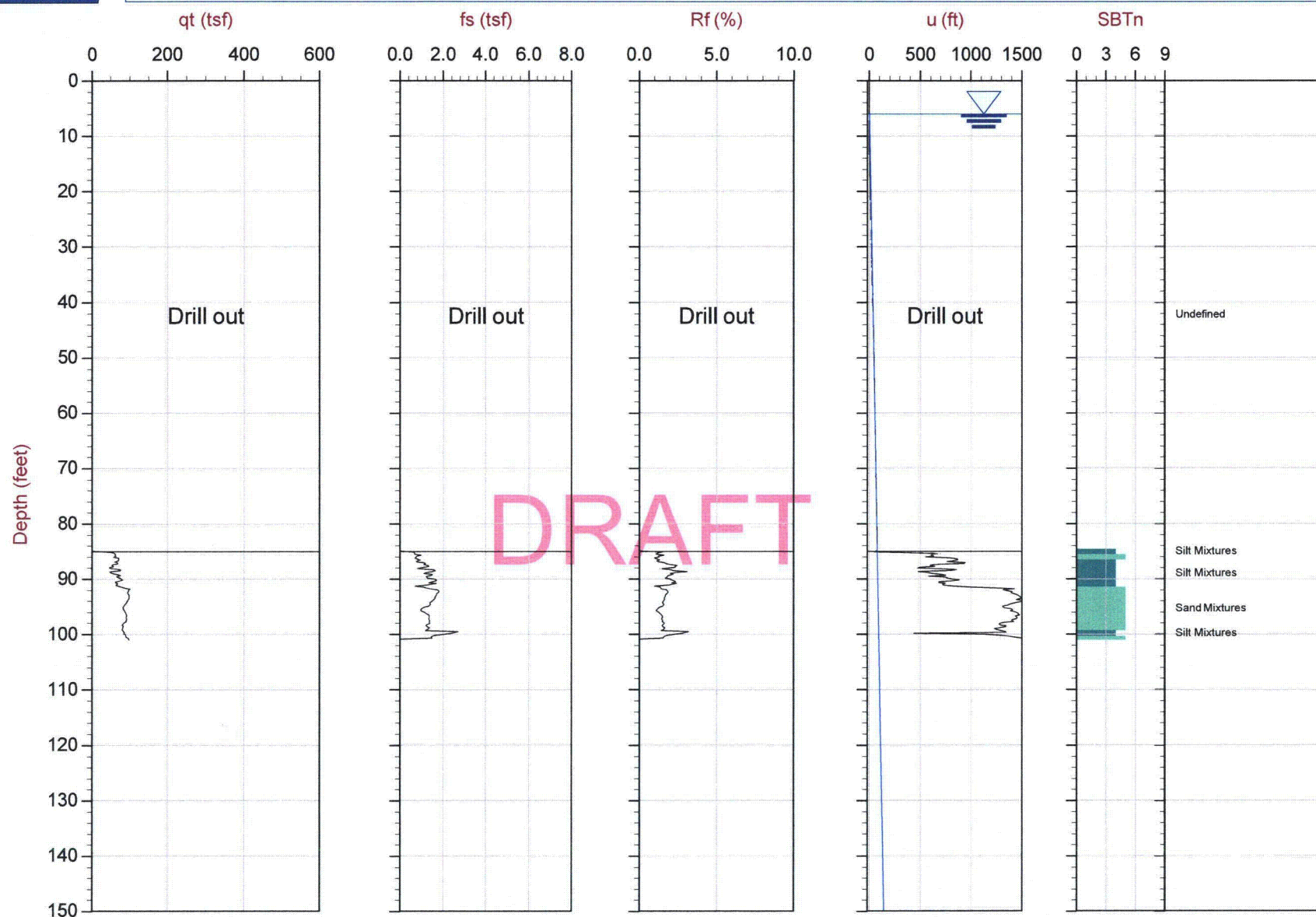




Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

File: 965CP09.COR
Unit Wt: SBT Chart Soil Zones

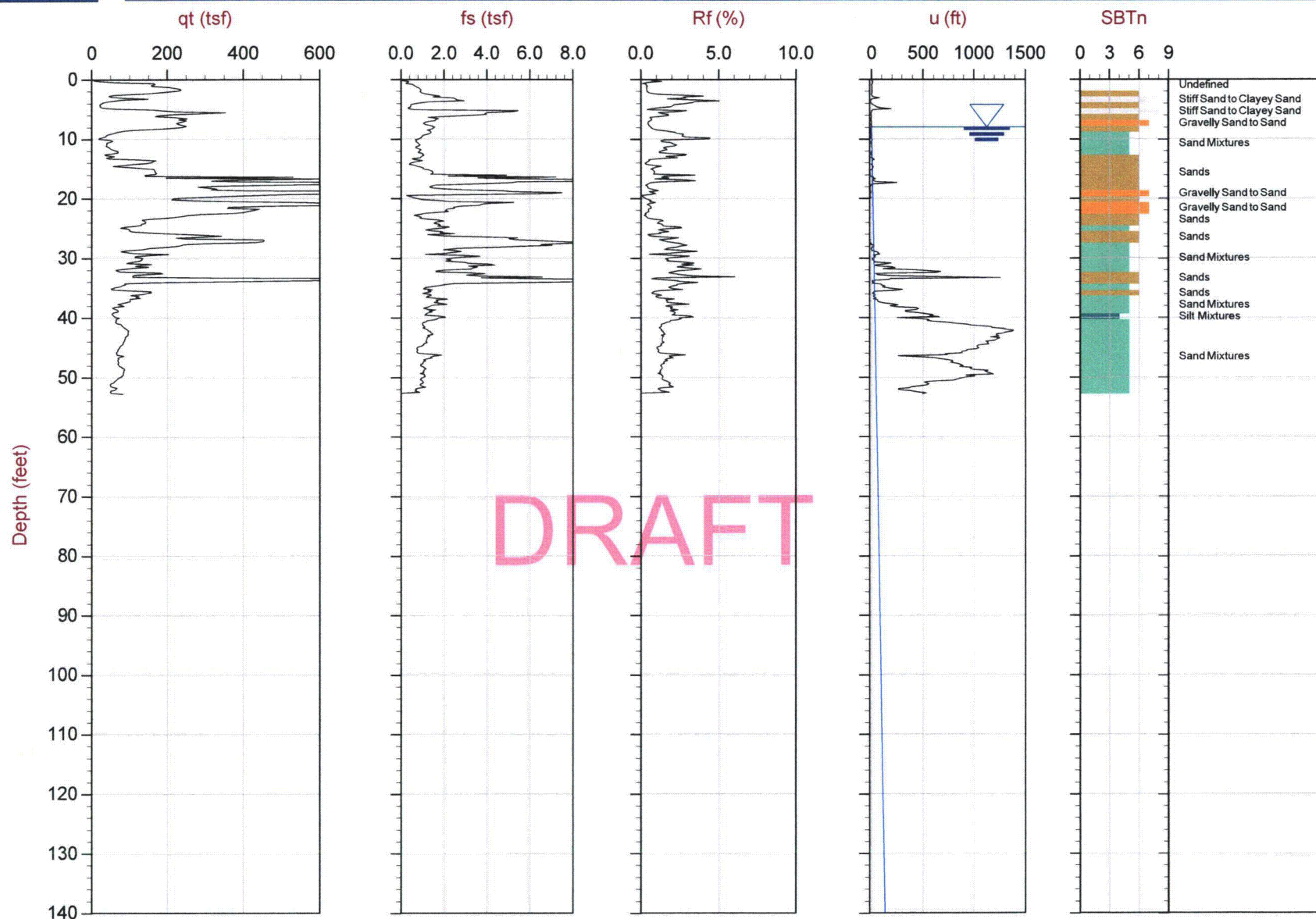
SBT: Lunne, Robertson and Powell, 1997
Page No: 1 of 1



Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

File: 965CP20.COR
Unit Wt: SBT Chart Soil Zones

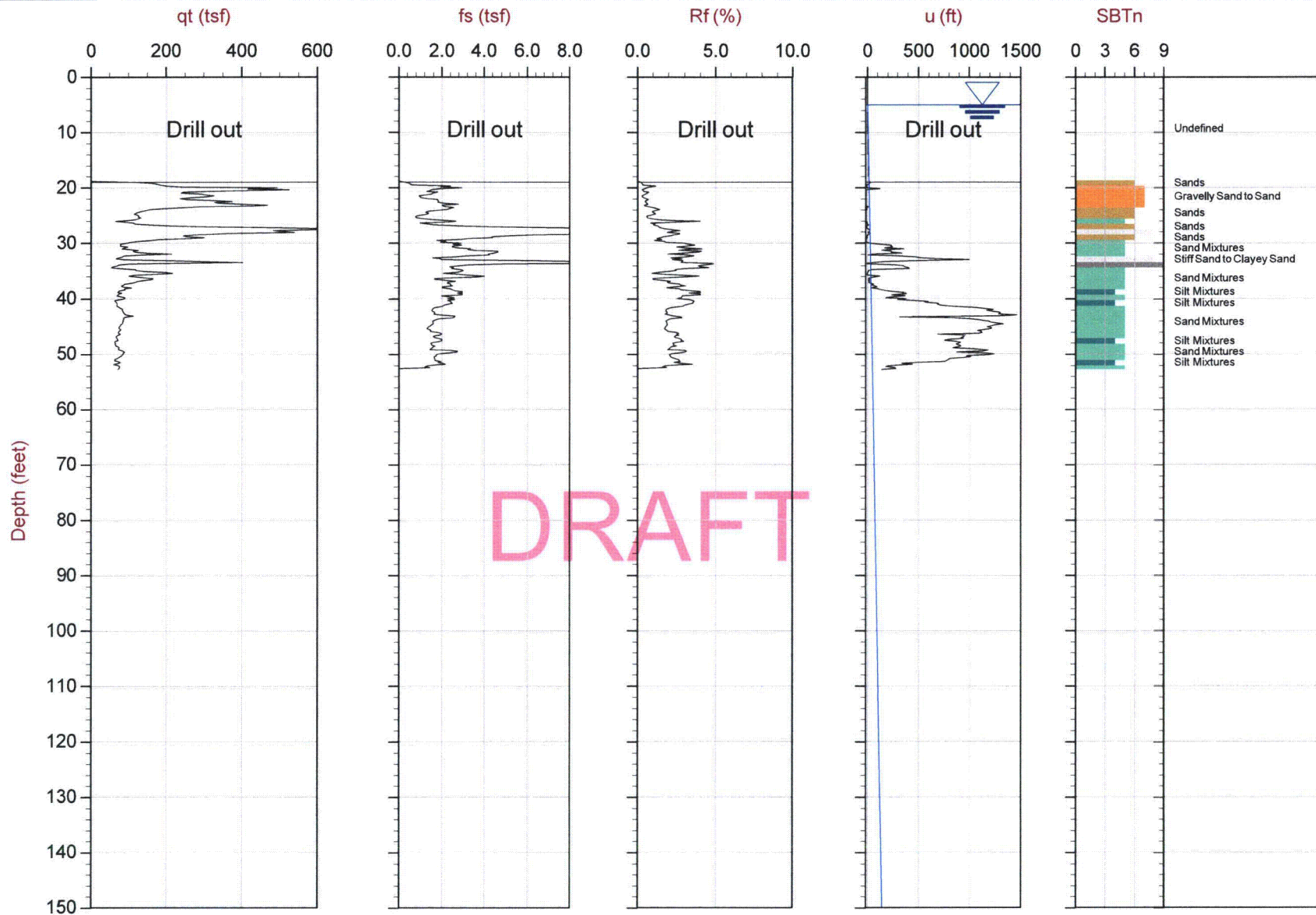
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Page No: 1 of 1



Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

File: 965CP02.COR
Unit Wt: SBT Chart Soil Zones

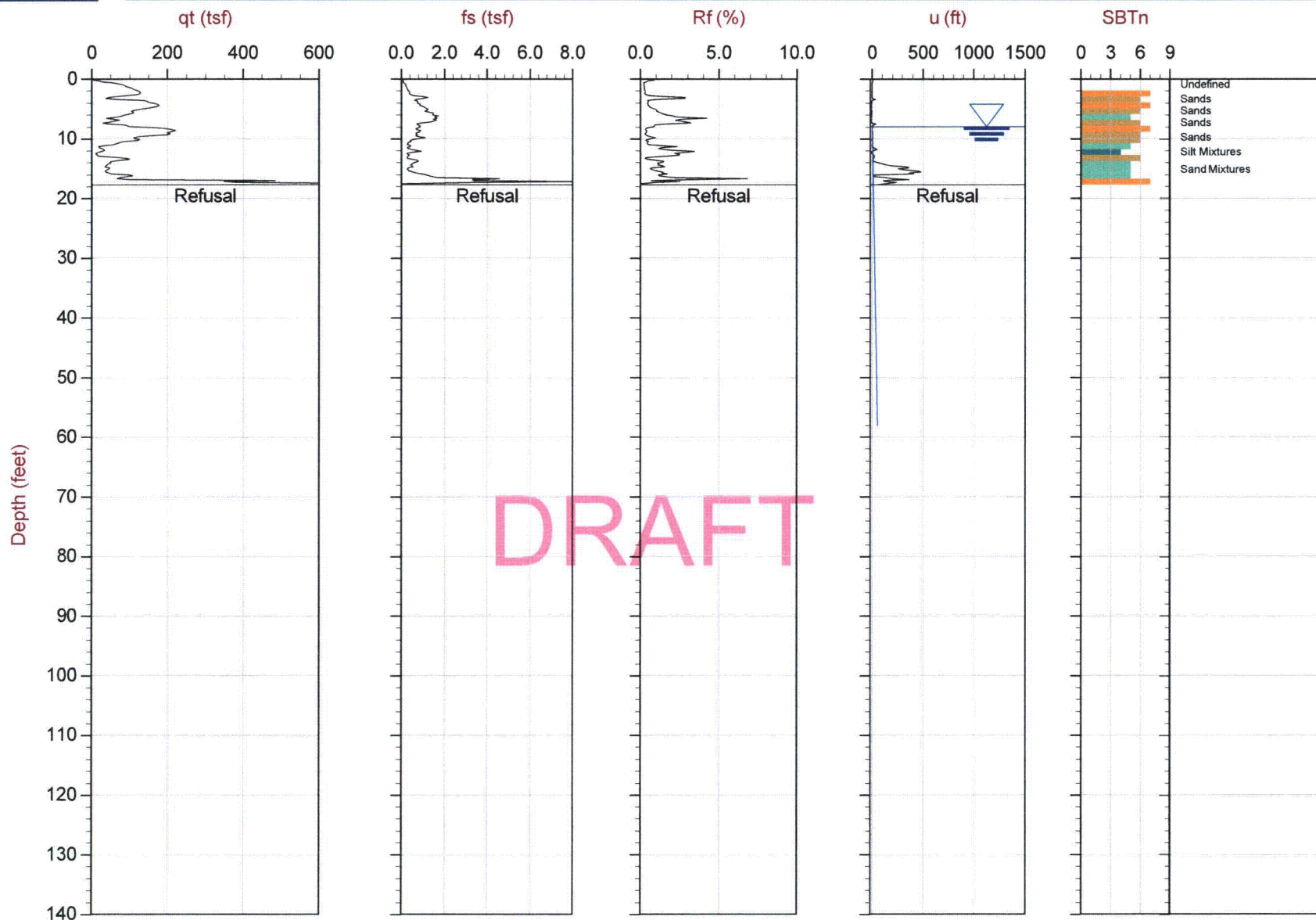
SBT: Lunne, Robertson and Powell, 1997
Page No: 1 of 1



Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

File: 965CP15.COR
Unit Wt: SBT Chart Soil Zones

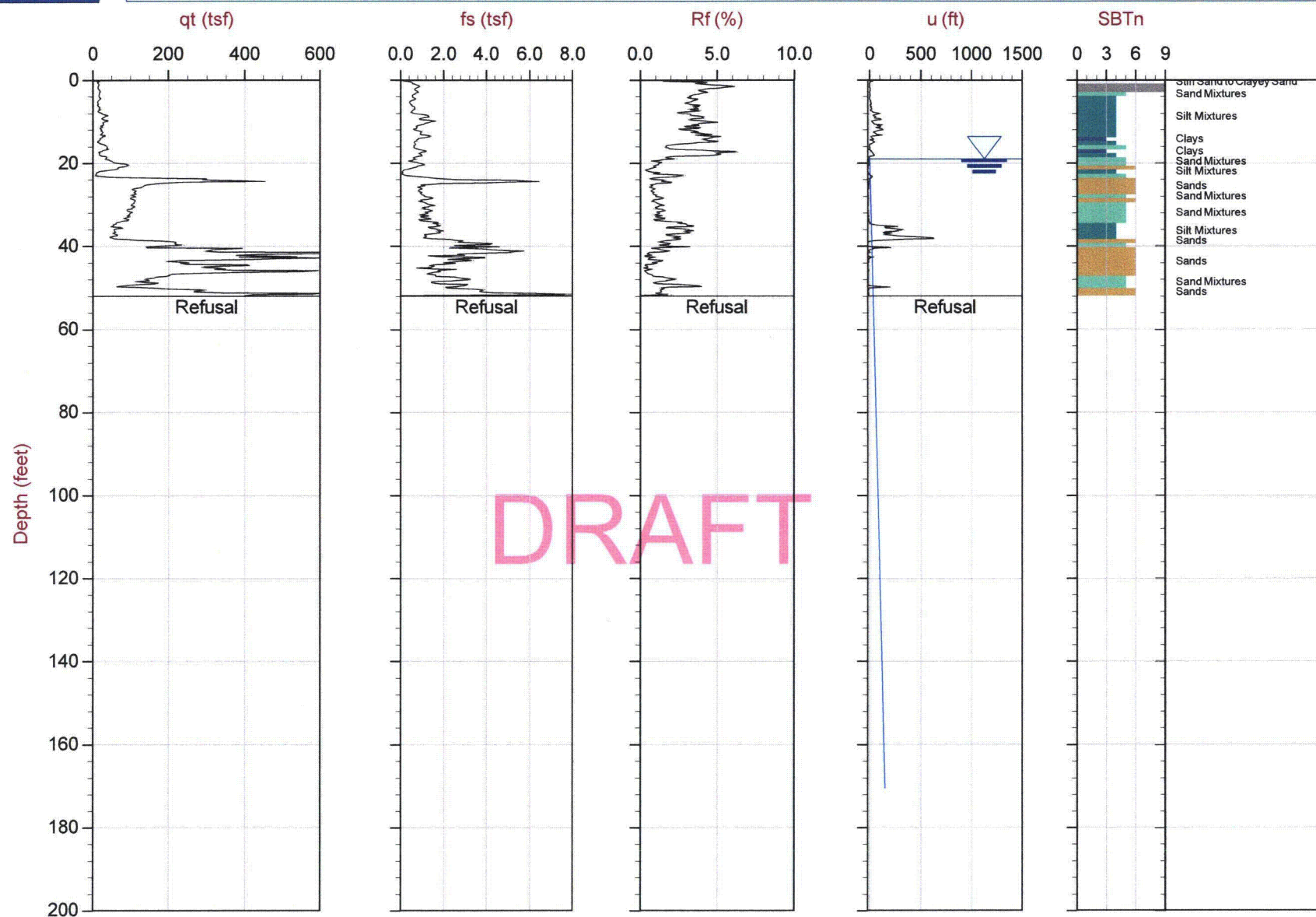
SBT: Lunne, Robertson and Powell, 1997
Page No: 1 of 1



Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

File: 965CP01.COR
Unit Wt: SBT Chart Soil Zones

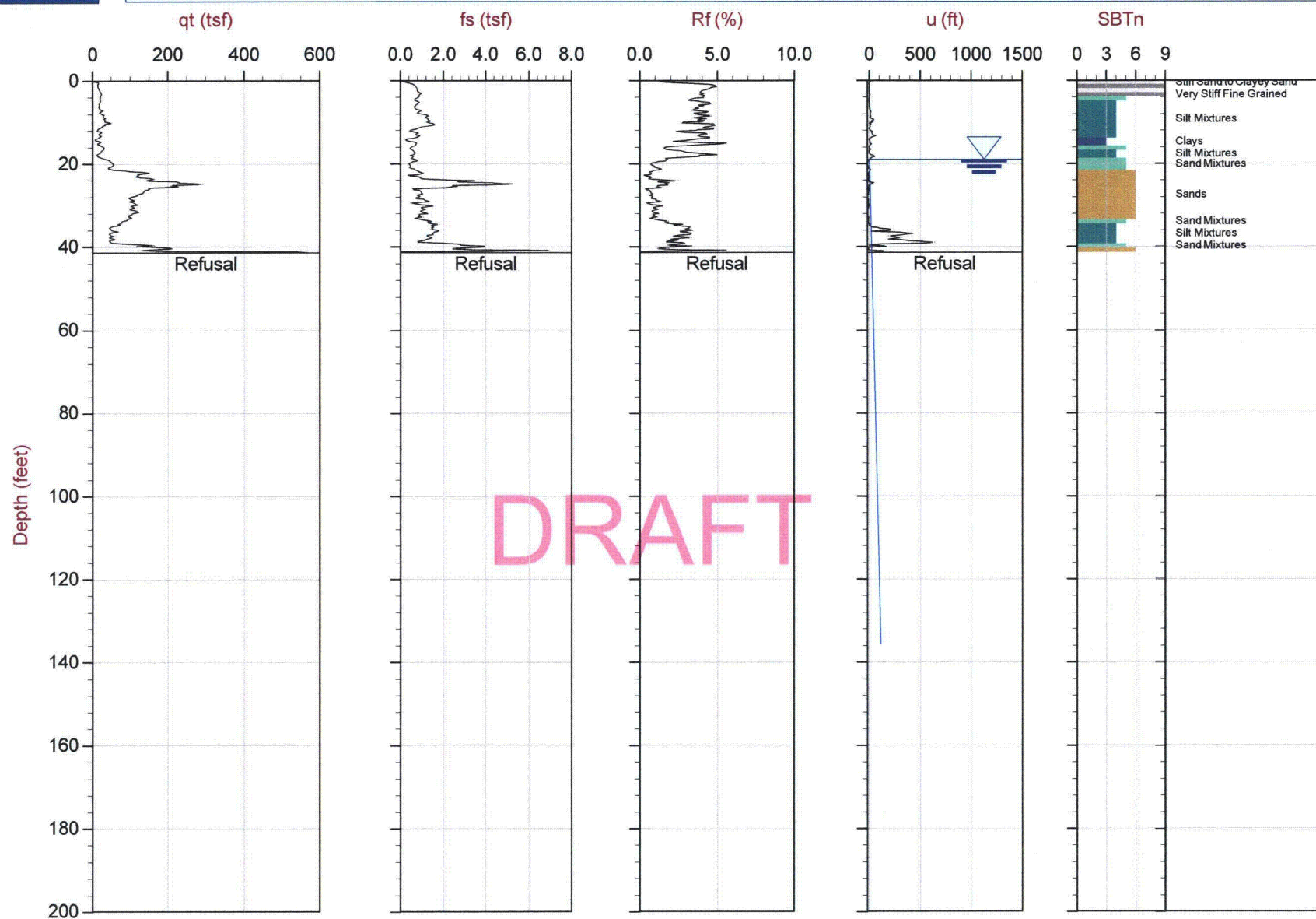
SBT: Lunne, Robertson and Powell, 1997
Page No: 1 of 1



Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

File: 965CP34.COR
Unit Wt: SBT Chart Soil Zones

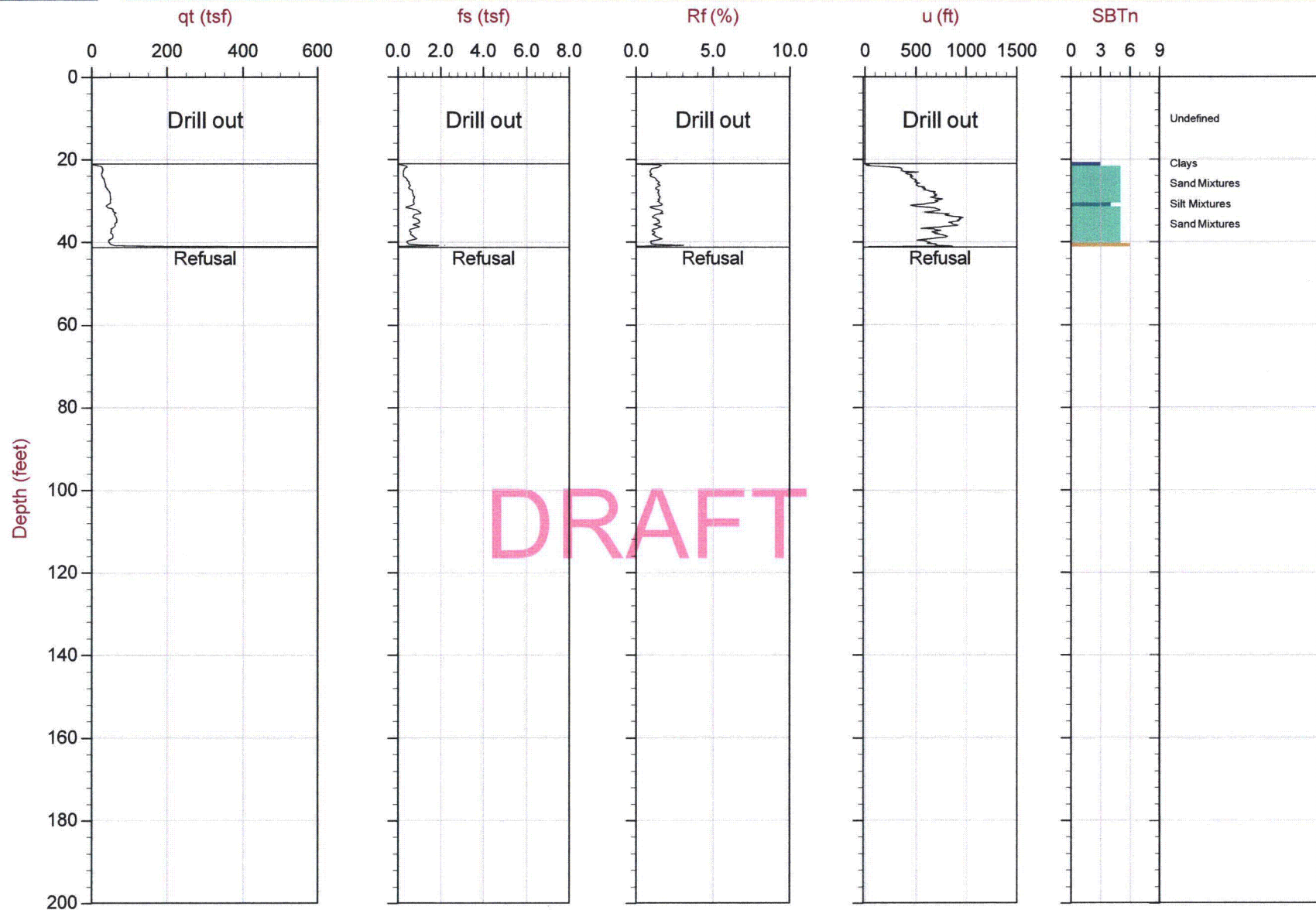
SBT: Lunne, Robertson and Powell, 1997
Page No: 1 of 1



Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

File: 965CP33.COR
Unit Wt: SBT Chart Soil Zones

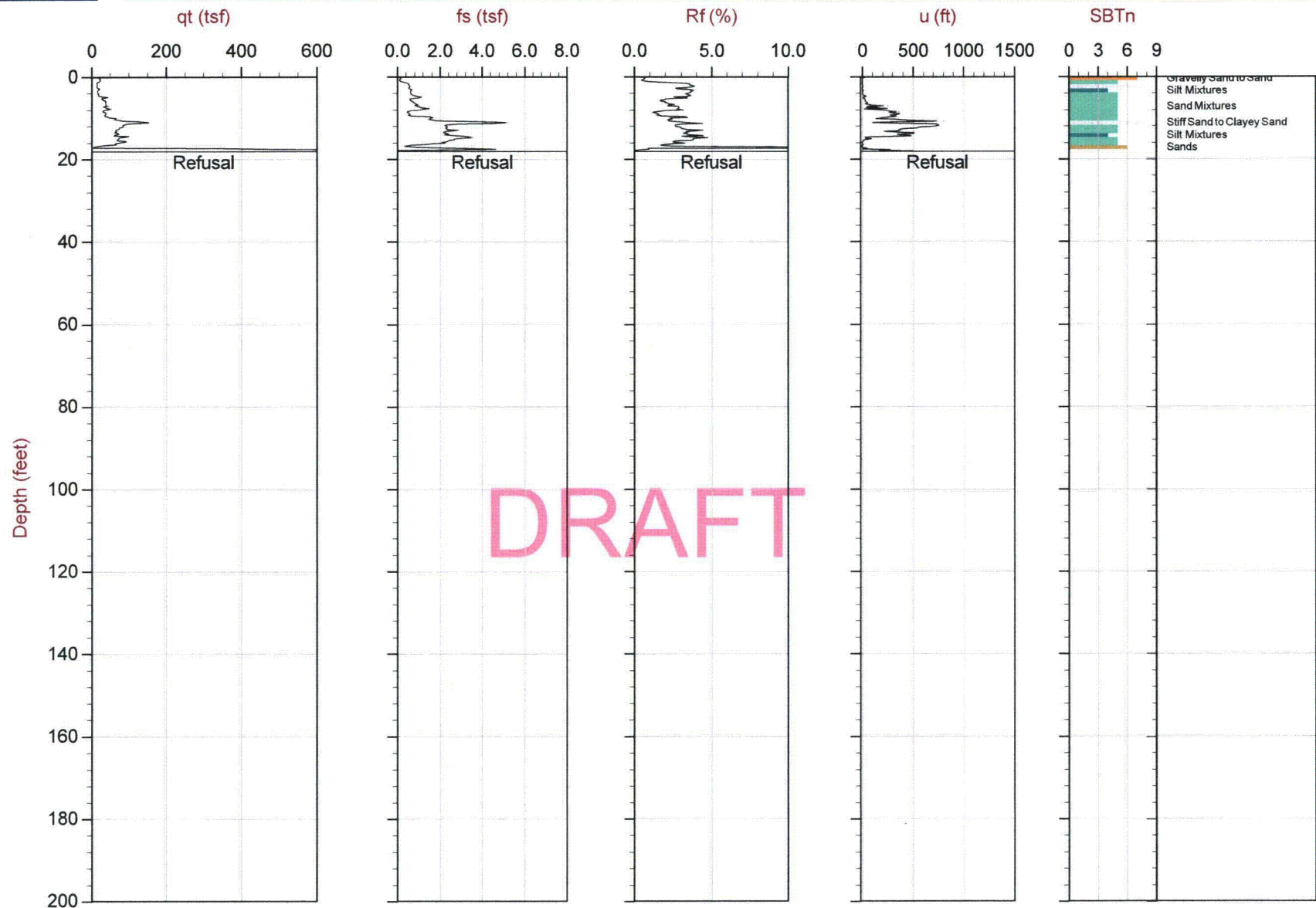
SBT: Lunne, Robertson and Powell, 1997
Page No: 1 of 1



Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

File: 965CP37.COR
Unit Wt: SBT Chart Soil Zones

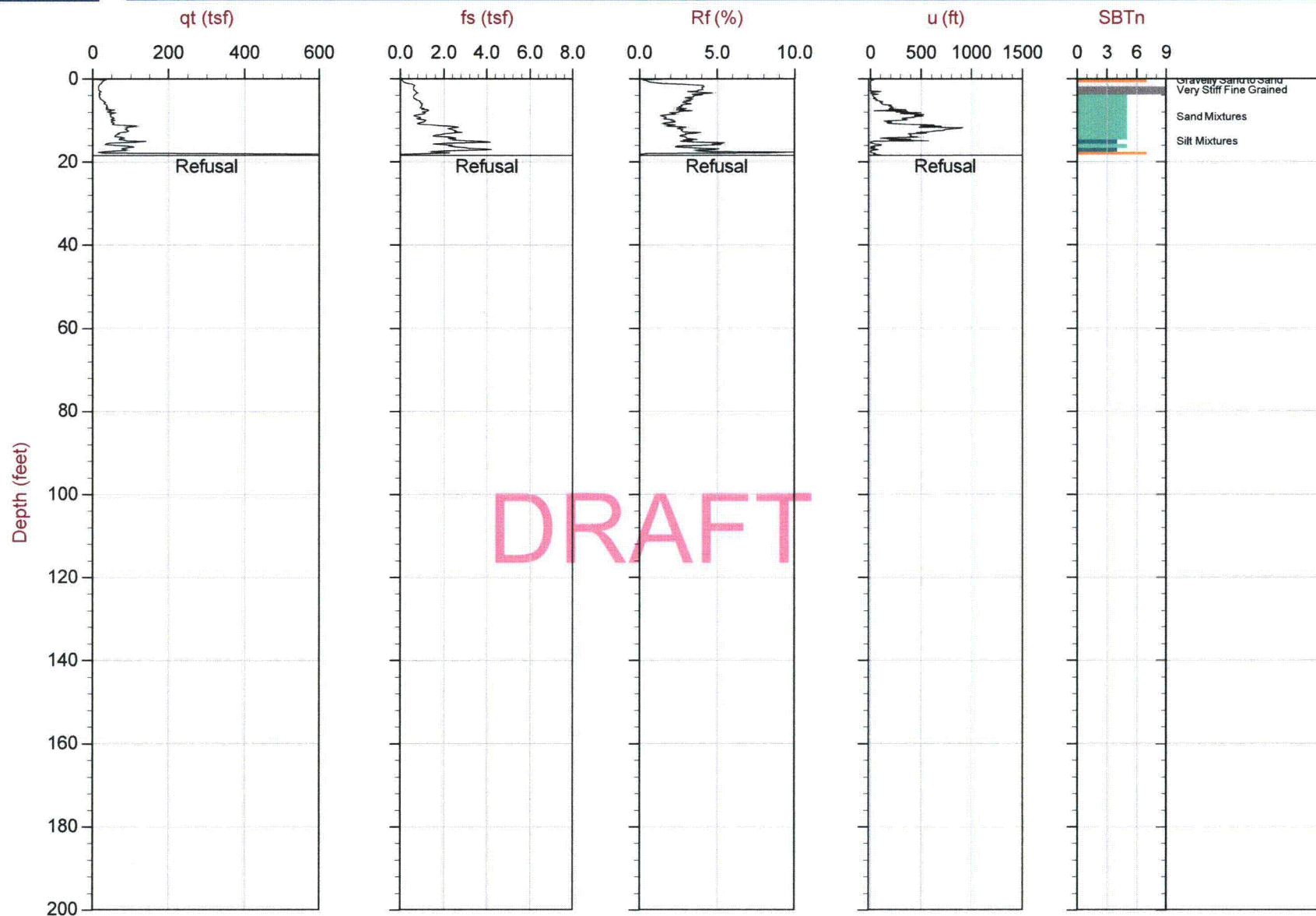
SBT: Lunne, Robertson and Powell, 1997
Page No: 1 of 1



Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

File: 965CP36.COR
Unit Wt: SBT Chart Soil Zones

SBT: Lunne, Robertson and Powell, 1997
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Depth Inc: 0.050 m / 0.164 ft
Avg Int: 0.300 m

File: 965CP32.COR
Unit Wt: SBT Chart Soil Zones

SBT: Lunne, Robertson and Powell, 1997
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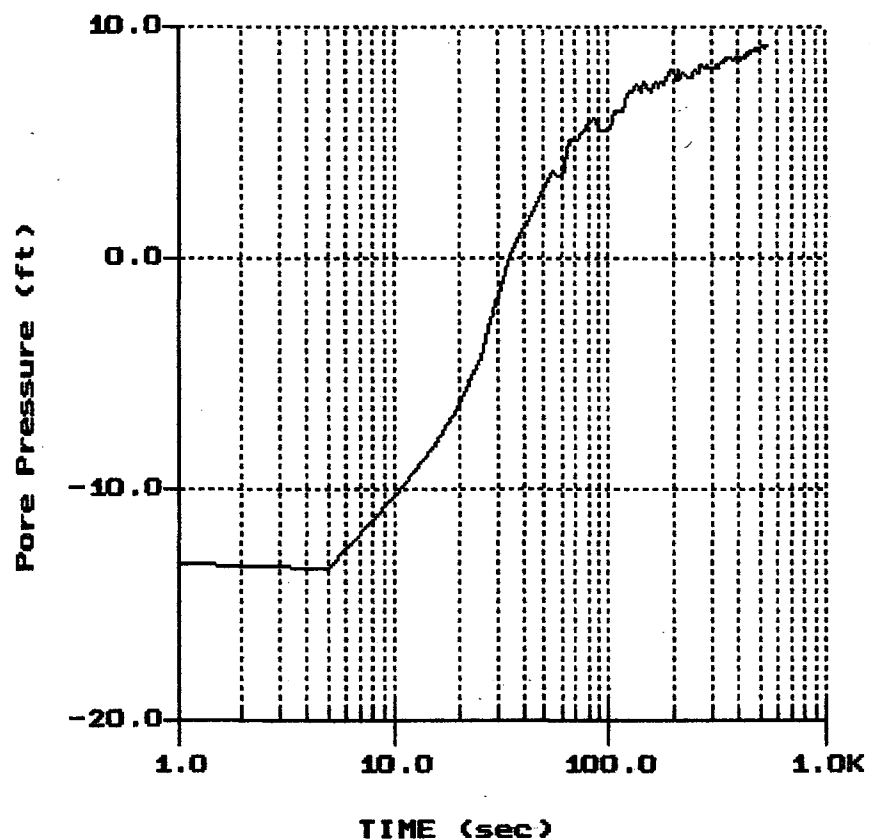
- Draft Pore Pressure Dissipation Records -

Schnabel

Hole: C-727
Location: CCNPP

Cone: STD 20T AD214
Date: 08:06:08 09:50

PORE PRESSURE DISSIPATION RECORD



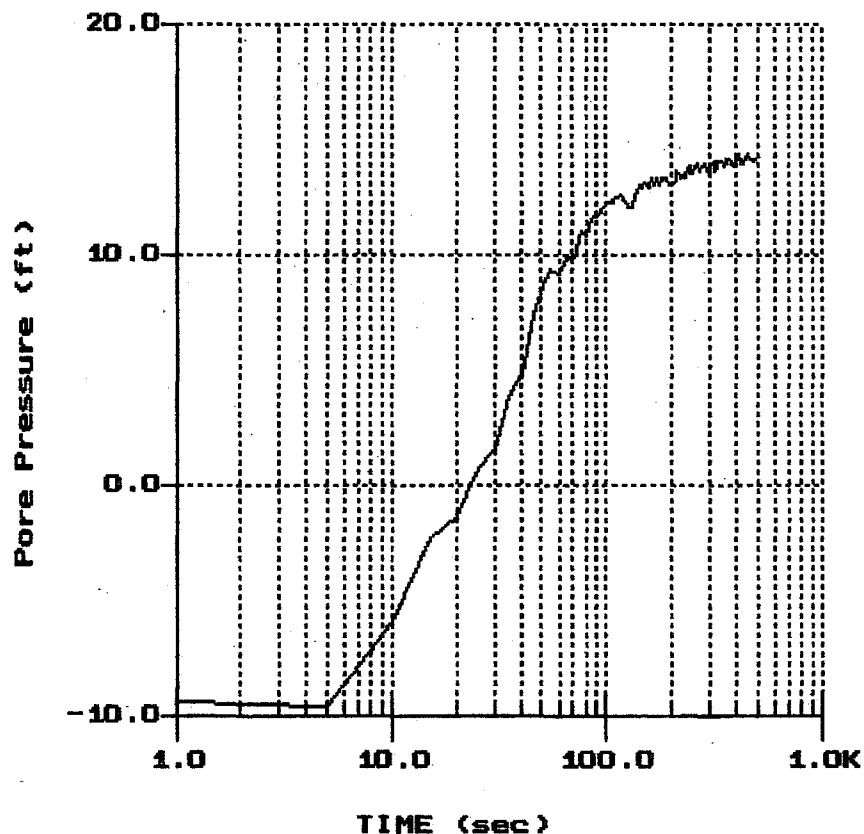
File: 965CP08.PPD
Depth (m): 4.60
(ft): 15.09
Duration: 535.0s
U-min: -13.46 5.0s
U-max: 9.20 535.0s

Schnabel

Hole: C-727
Location: CKNPP

Cone: STD 20T AD214
Date: 08:06:08 09:50

PORE PRESSURE DISSIPATION RECORD



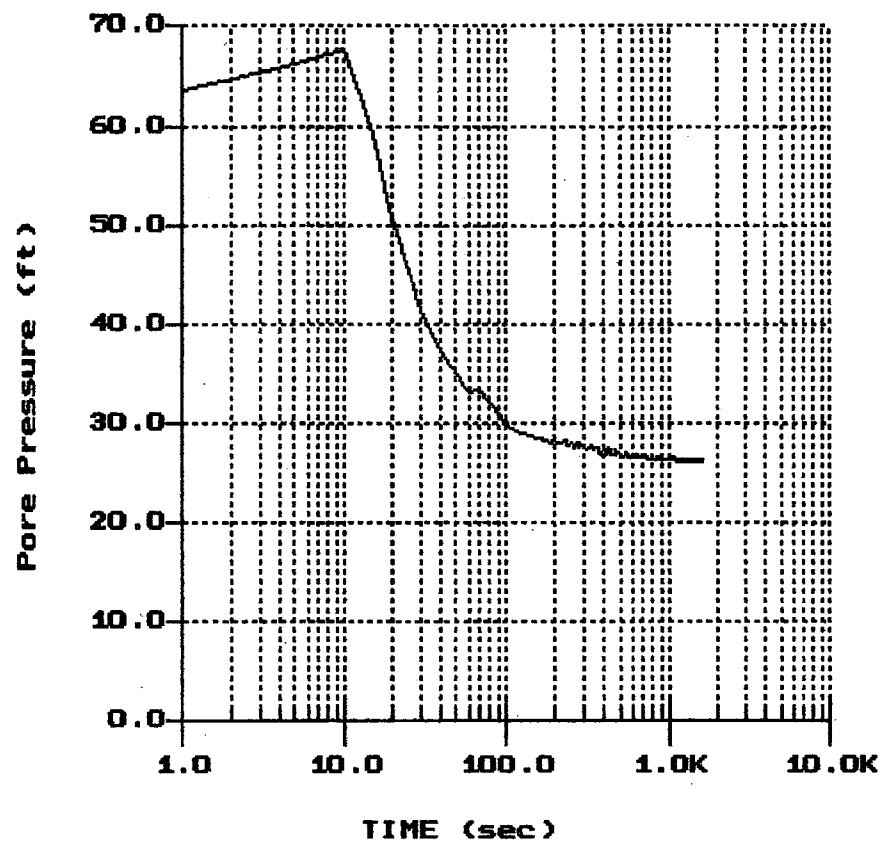
File: 965CP08.PPD
Depth (m): 6.10
(ft): 20.01
Duration: 480.0s
U-min: -9.53 5.0s
U-max: 14.38 445.0s

Schnabel

Hole: C-727
Location: CCNPP

Cone: STD 20T AD214
Date: 08:06:08 09:50

PORE PRESSURE DISSIPATION RECORD



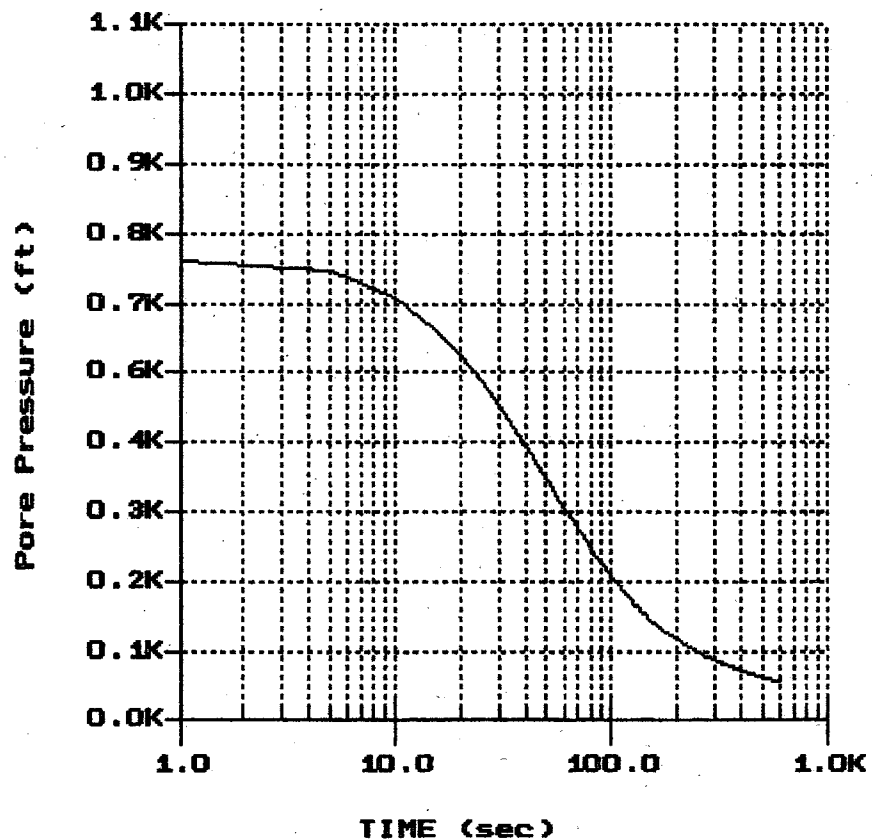
File: 965CP08.PPD
Depth (m): 9.30
(ft): 30.51
Duration: 1625.0s
U-min: 6.67 0.0s
U-max: 67.58 10.0s

Schnabel

Hole: C-727
Location: CCNPP

Cone: STD 20T AD214
Date: 08:06:08 09:50

PORE PRESSURE DISSIPATION RECORD



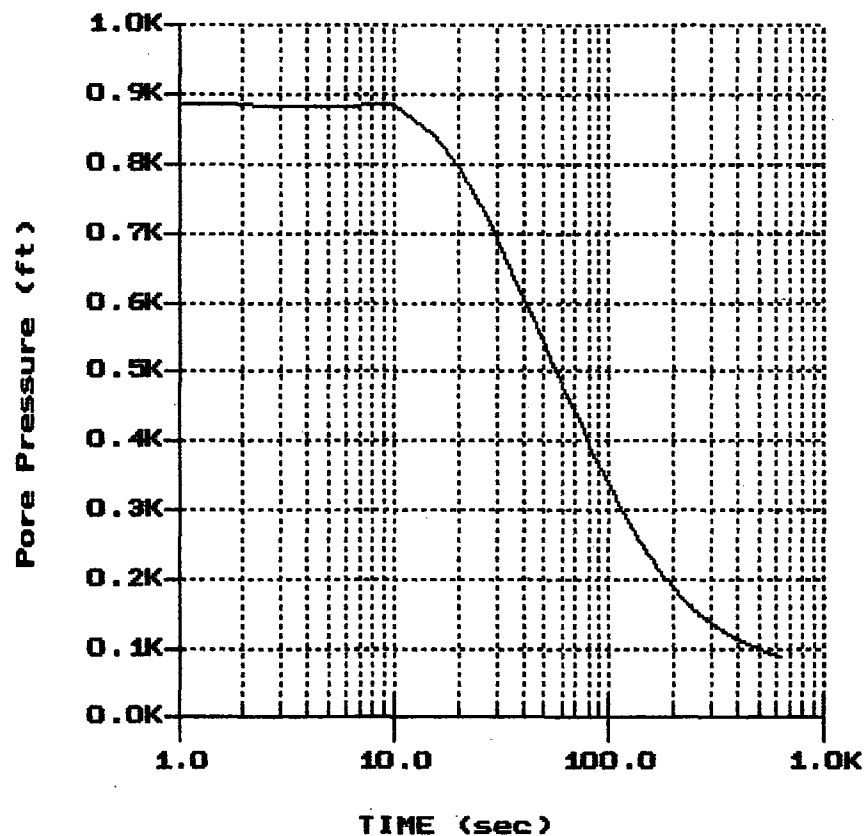
File: 965CP08.PPD
Depth (m): 10.70
 (ft): 35.10
Duration : 595.0s
U-min: 59.97 595.0s
U-max: 1061.56 0.0s

Schnabel

Hole: C-727
Location: CCNPP

Cone: STD 20T AD214
Date: 08:06:08 09:50

PORE PRESSURE DISSIPATION RECORD



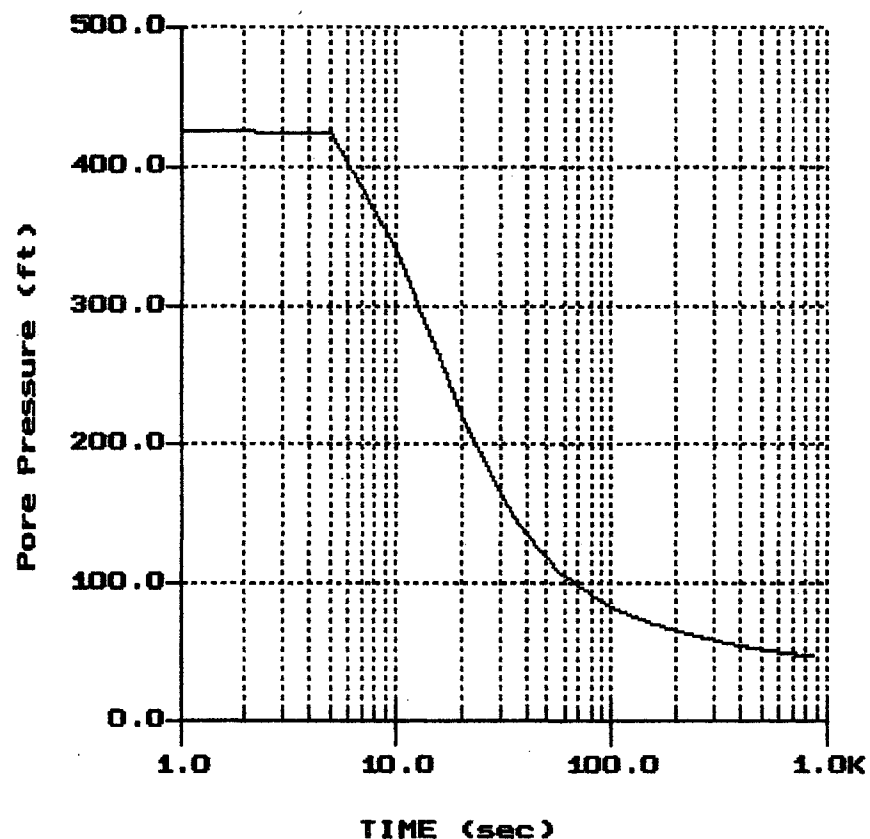
File: 965CP08.PPD
Depth (m): 12.20
(ft): 40.03
Duration: 630.0s
U-min: 86.37 630.0s
U-max: 919.48 0.0s

Schnabel

Hole: C-727
Location: CCNPP

Cone: STD 20T AD214
Date: 08:06:08 09:50

PORE PRESSURE DISSIPATION RECORD



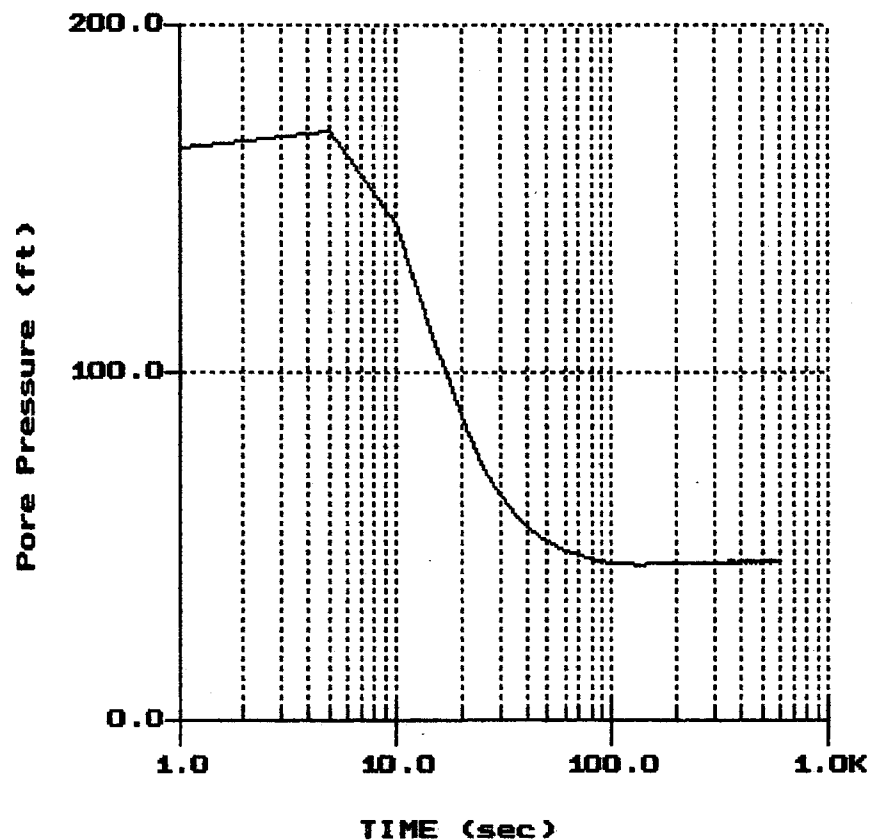
File: 965CP08.PPD
Depth (m): 13.80
 (ft): 45.28
Duration : 865.0s
U-min: 46.32 865.0s
U-max: 450.80 0.0s

Schnabel

Hole: C-727
Location: CCNPP

Cone: STD 20T AD214
Date: 08:06:08 09:50

PORE PRESSURE DISSIPATION RECORD



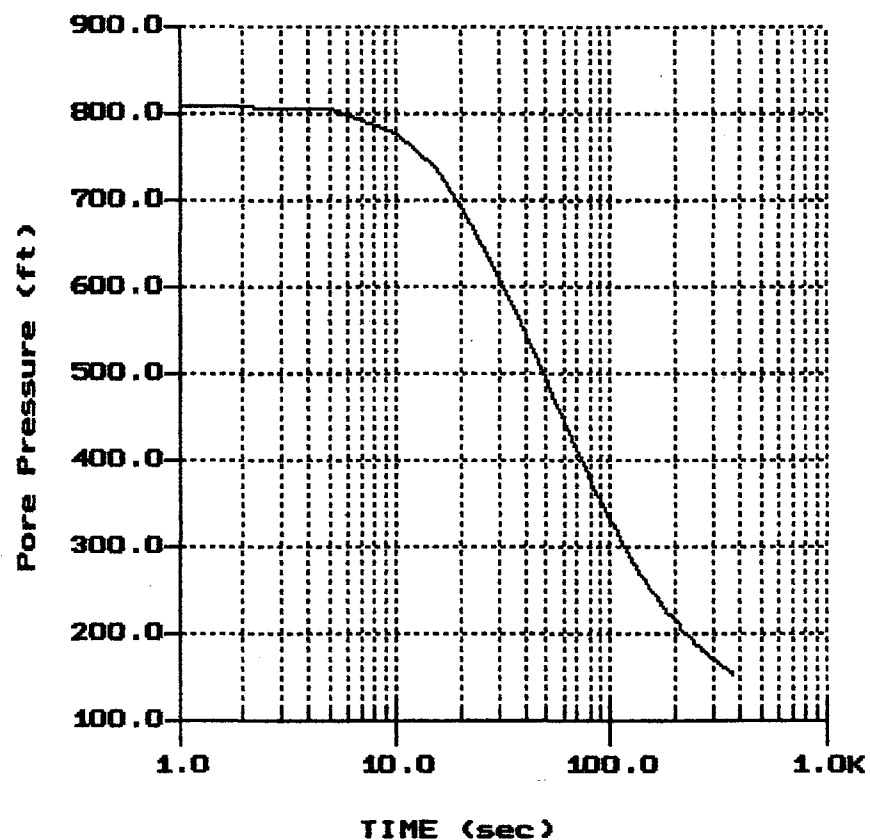
File: 965CP08.PPD
Depth (m): 15.30
(ft): 50.20
Duration: 600.0s
U-min: 44.75 140.0s
U-max: 169.65 5.0s

Schnabel

Hole: C-727
Location: CCNPP

Cone: STD 20T AD214
Date: 08:06:08 09:50

PORE PRESSURE DISSIPATION RECORD



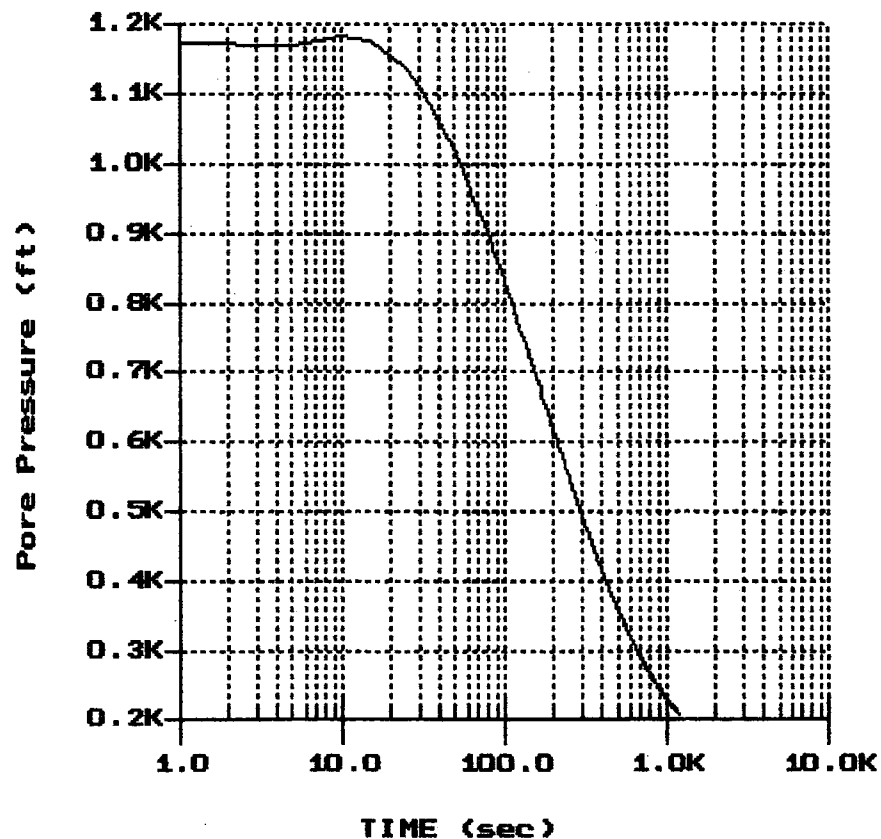
File: 96SCP08.PPD
Depth (m): 21.35
(ft): 70.05
Duration : 370.0s
U-min: 153.60 370.0s
U-max: 831.78 0.0s

Schnabel

Hole: C-727
Location: CKNPP

Cone: STD 20T AD214
Date: 08:06:08 09:50

PORE PRESSURE DISSIPATION RECORD



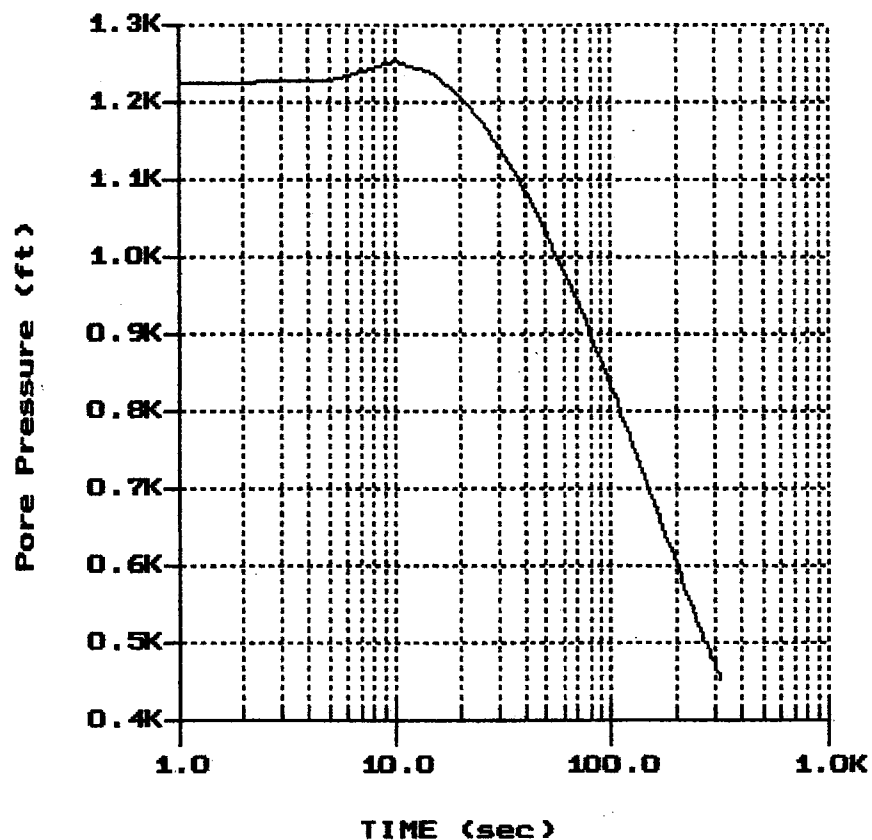
File: 965CP08.PPD
Depth (m): 22.90
(ft): 75.13
Duration: 1180.0s
U-min: 207.30 1180.0s
U-max: 1188.33 0.0s

Schnabel

Hole: C-727
Location: CCNPP

Cone: STD 20T AD214
Date: 08:06:08 09:50

PORE PRESSURE DISSIPATION RECORD



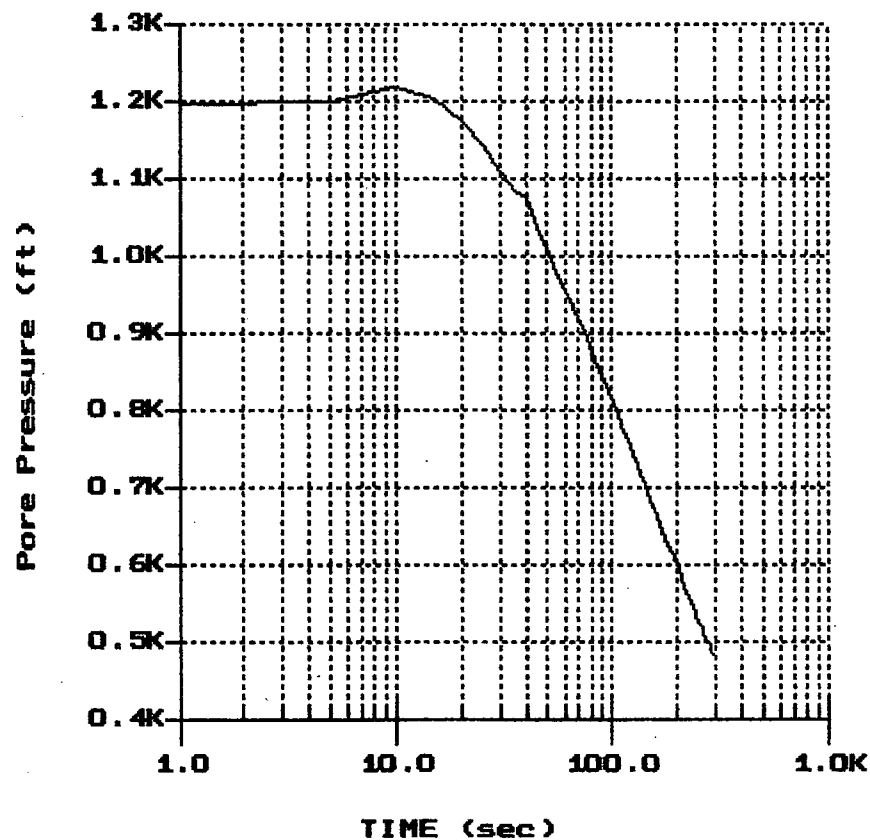
File: 965CP08.PPD
Depth (m): 24.40
(ft): 80.05
Duration : 315.0s
U-min: 452.83 315.0s
U-max: 1252.51 10.0s

Schnabel

Hole: C-727
Location: CKNPP

Cone: STD 20T AD214
Date: 08:06:08 09:50

PORE PRESSURE DISSIPATION RECORD



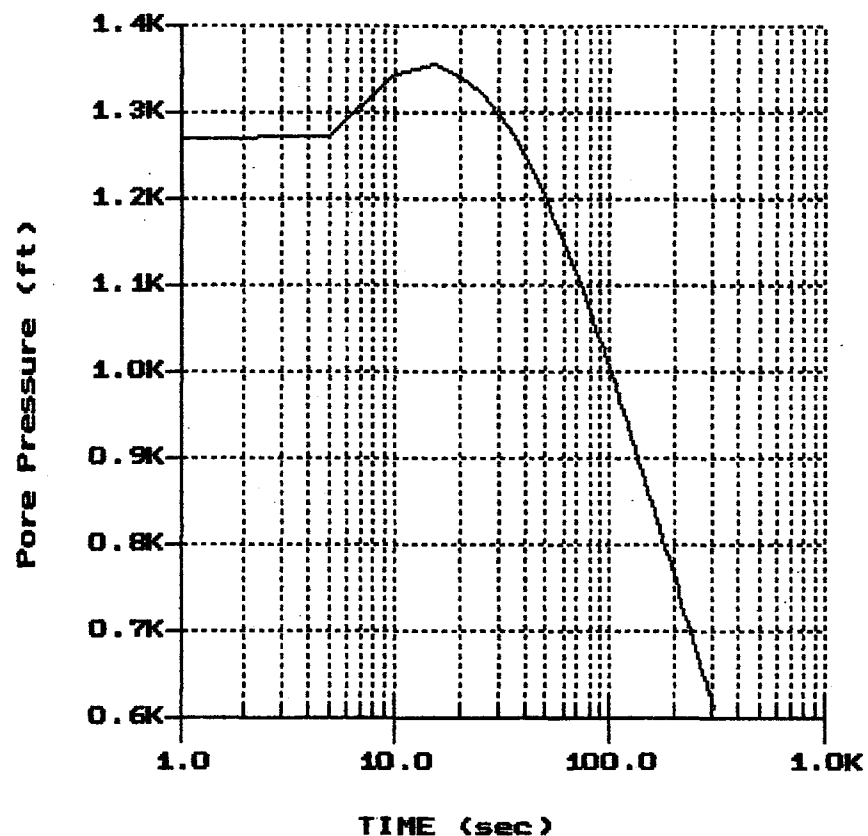
File: 965CP08.PPD
Depth (m): 25.95
(ft): 85.14
Duration : 295.0s
U-min: 479.21 295.0s
U-max: 1220.21 10.0s

Schnabel

Hole: C-727
Location: CCNPP

Cone: STD 20T AD214
Date: 08:06:08 09:50

PORE PRESSURE DISSIPATION RECORD



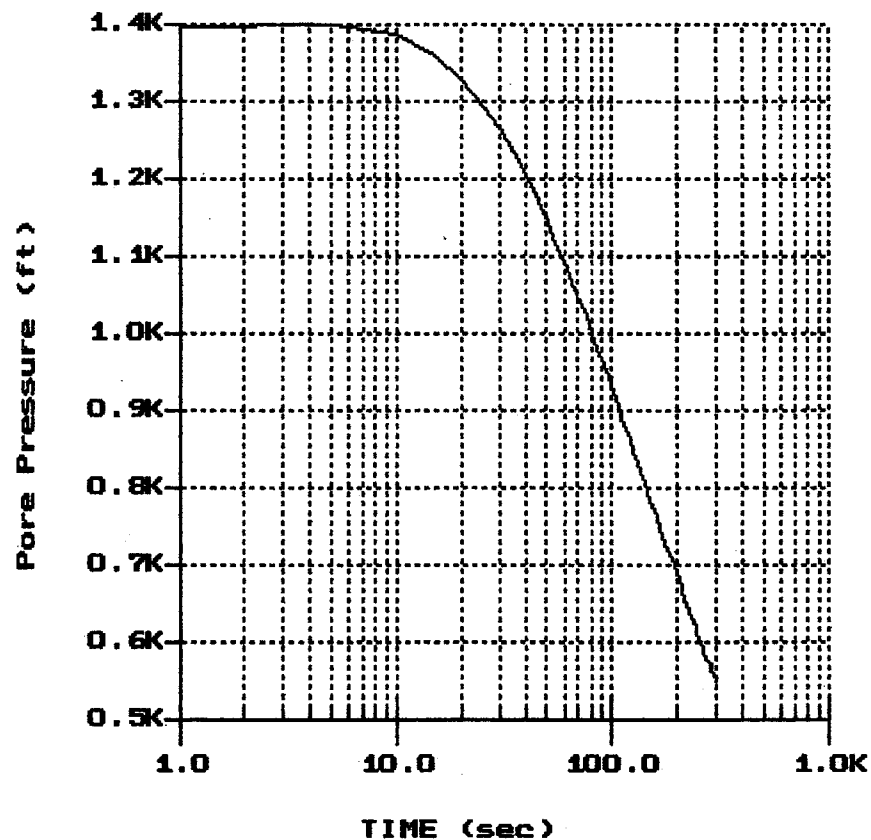
File: 965CP08.PPD
Depth (m): 27.45
 (ft): 90.06
Duration : 305.0s
U-min: 610.40 305.0s
U-max: 1356.13 15.0s

Schnabel

Hole: C-727
Location: CKNPP

Cone: STD 20T AD214
Date: 08:11:08 11:46

PORE PRESSURE DISSIPATION RECORD



File: 965CP20.PPD
Depth (m): 30.50
(ft): 100.07
Duration : 295.0s
U-min: 551.11 295.0s
U-max: 1398.45 5.0s

Draft SPT Logs

- Draft gINT Logs -
- gINT Logs -
- Handwritten Field SPT Logs -

- Draft gINT Logs -

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-342**
Schnabel No.: 06120048
Sheet: 1 of 10

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: W. Wolfe

Schnabel Representative: D. Cepull

Equipment: CME-550; AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3 1/4" O.D. Tri-Cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/31/08 Finished: 8/5/08

Easting: 960272.2 ft Northing: 217216.7 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 76.0 (ft) Total Depth: 250.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/31	4:58 PM	12.5'	13.0'	---
Start of Day	8/1	6:53 AM	-1.3'	13.0'	---
End of Day	8/1	2:00 PM	-1.5'	13.0'	---
Start of Day	8/4	8:45 AM	7.0'	13.0'	---
End of Day	8/4	6:08 PM	-0.5'	13.0'	---
Start of Day	8/5	7:00 AM	13.0'	13.0'	---
Completion	8/5	6:28 PM	3.0'	13.0'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.5	0.0 - 0.5 ft: Rootmat and topsoil, organics	SP-SM	75.5			S-1, SPT 1+1+2 REC=17", 94%		0.0 ft: advanced 4 1/4" ID HSA to 12.5 ft; 0.0 to 2.5 interval: uniform drilling resistance, orangish brown sand with silt cuttings; changes as noted below; see end of boring log for additional remarks
	0.5 - 8.4 ft: POORLY GRADED SAND WITH SILT, medium grained sand, moist, orangish brown, contains mica, no HCl reaction					S-2, SPT 1+2+3 REC=15", 83%		
	5.0 ft: Changes to homogenous structure				5	S-3, SPT 4+5+4 REC=13", 72%		
8.4	7.5 ft: Changes to contains iron cemented sand layer between 7.5 and 7.6 ft	SC	67.6			S-4, SPT 5+5+2 REC=18", 100%		7.5 - 8.4 ft: jar labeled as S-4A 8.4 - 9.0 ft: jar labeled as S-4B
	8.4 - 12.0 ft: CLAYEY SAND, medium grained sand, moist, orangish brown and light gray, contains mica, no HCl reaction				10	S-5, SPT 1+1+2 REC=13", 72%		
12.0	9.5 ft: Changes to no mica							
	12.0 - 14.5 ft: LEAN CLAY WITH SAND, moist, gray, contains mica, no HCl reaction, soft, homogenous structure	CL	64.0			S-6, SPT 2+3+8 REC=18", 100%		12.5 ft: encountered groundwater; switch to 3-1/4" OD tricone roller bit and advanced to 248.5 ft; marsh funnel test performed, 35 sec drilling fluid 15.0 - 18.5 ft: uniform drilling resistance, brownish gray drilling fluid, clayey sand cuttings
14.5	14.5 - 17.5 ft: CLAYEY SAND, fine to medium grained sand, moist, gray, contains mica, no HCl reaction	SC	61.5		15	S-7, SPT 1+2+3 REC=18", 100%		
17.5	17.5 - 32.0 ft: SANDY LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction, soft, homogenous structure	CL	58.5			S-8, SPT 2+3+3 REC=18", 100%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
23.5 ft	Changes to contains ~ 1 inch layer of silty sand					S-9, SPT 3+3+4 REC=18", 100%		
25.0 ft	Changes to firm				25	S-10, SPT WOH+1+4 REC=13", 72%		
		CL				S-11, SPT 3+4+5 REC=18", 100%		
30.0 ft	Changes to hard				30	S-12, SPT 4+6+8 REC=18", 100%		
32.0	32.0 - 34.5 ft: FAT CLAY WITH SAND, fine grained sand, moist, gray, contains mica, no HCl reaction, hard, homogenous structure	CH	44.0			S-13, SPT 6+7+8 REC=18", 100%		32.5 - 35.0 ft: uniform drilling resistance, gray drilling fluid
34.5	34.5 - 37.0 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, no HCl reaction, homogenous structure	SM	41.5		35	S-14, SPT 3+3+4 REC=18", 100%		
37.0	37.0 - 39.5 ft: SILTY SAND, fine to medium grained sand, moist, gray, contains mica, no HCl reaction, homogenous structure	SM	39.0			S-15, SPT 5+9+13 REC=18", 100%		
39.5	39.5 - 40.5 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, no HCl reaction	SM	36.5		40	S-16, SPT 33+49+50/3" REC=15", 96%		40.0 - 40.5 ft: jar labeled as S-16A
40.5	40.5 - 42.0 ft: SILTY GRAVEL WITH SAND, fine to coarse gravel, subangular particles, moist, gray, contains mica, no HCl reaction, gravel as cemented sand	GM	35.5					40.0 - 41.0 ft: uniform drilling resistance
42.0	42.0 - 49.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, contains mica, highly weathered shells, weak HCl reaction with soil	SP-SM	34.0			S-17, SPT 23+24+36 REC=18", 100%		40.5 - 41.3 ft: jar labeled as S-16B
44.5 ft	Changes to estimated 15 - 25% shell fragments				45	S-18, SPT 19+43+50/4" REC=16", 103%		41.0 - 42.5 ft: hard drilling
45.8 ft	Changes to laminated							42.5 - 45.0 ft: uniform drilling resistance
								45.0 - 47.5 ft: light gray drilling fluid

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04 22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
47.5	Changes to estimated 5 - 10% shell fragments, highly weathered shell fragments	SP-SM				S-19, SPT 35+41+32 REC=18", 100%		47.5 - 50.0 ft: gray drilling fluid
49.5	49.5 - 51.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray, estimated 5 - 10% shell fragments, contains mica, no HCl reaction	SP-SM	26.5		50	S-20, SPT 7+11+16 REC=18", 100%		50.0 - 51.5 ft: jar labeled as S-20A
51.0	51.0 - 52.0 ft: LEAN CLAY, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, weak HCl reaction	CL	25.0			S-21, SPT 4+4+6 REC=18", 100%		51.0 - 51.5 ft: jar labeled as S-20B
52.0	52.0 - 54.5 ft: SANDY LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction, hard, homogenous structure	CL	24.0					
54.5	54.5 - 60.0 ft: CLAYEY SAND, fine grained sand, moist, gray, contains shell fragments, contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)	SC	21.5		55	S-22, SPT 4+4+5 REC=18", 100%		
60.0	60.0 - 61.5 ft: POORLY GRADED SAND WITH SILT AND GRAVEL, fine grained sand, subangular particles, moist, gray, contains mica, no HCl reaction, gravel as cemented sand	SP-SM	16.0		60	S-24, SPT 50/6" REC=6", 100%		60.0 - 62.5 ft: uniform drilling resistance
61.5	61.5 - 64.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated 15 - 25% fine gravel, contains mica, contains shell fragments, subangular fine gravel as cemented sands, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	14.5			S-25, SPT 6+22+10 REC=18", 100%		62.5 - 64.5 ft: rod chatter
64.5	64.5 - 67.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated 15 - 25% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	11.5		65	S-26, SPT 4+6+8 REC=18", 100%		65.0 - 66.5 ft: uniform drilling resistance
67.0	67.0 - 72.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated 5 - 10% shells, contains mica, no HCl reaction, moderately weathered shells	SP-SM	9.0			S-27, SPT 3+5+6 REC=18", 100%		
70.0	Changes to weak HCl reaction (with shells), no HCl reaction (with soil)				70	S-28, SPT 5+10+11 REC=18", 100%		70.0 - 71.5 ft: uniform drilling resistance
72.5	72.5 - 74.0 ft: SILTY GRAVEL WITH SAND, fine gravel, subangular particles, moist, gray, contains mica,	GM	3.5			S-29, SPT 50/4" REC=4", 111%		72.5 - 74.0 ft: hard drilling

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
74.0	gravel as fresh to moderately weathered shell fragments, weak HCl reaction (with shells)	SP-SM	2.0		75	S-30, SPT 4+7+9 REC=18", 100%		74.0 - 75.0 ft: uniform drilling resistance, smooth drilling 75.0 - 76.5 ft: uniform drilling resistance
77.0	74.0 - 77.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, contains shell fragments, contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)		-1.0					
	77.0 - 82.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, contains mica, no HCl reaction	SP-SM			80	S-31, SPT 5+4+6 REC=18", 100%		
82.0	82.0 - 84.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, contains shell fragments, contains mica, weak HCl reaction (with shells), no HCl reaction (with soil), shell fragments inclusions between 83.1 and 83.8 ft	SP-SM	-6.0			S-32, SPT 3+5+6 REC=18", 100%		87.5 - 88.0 ft: uniform drilling resistance 88.0 - 90.0 ft: hard drilling
84.5	84.5 - 87.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray, contains shell fragments, contains mica, no HCl reaction, layer of cemented sands and shell fragments between 85.4 and 85.6 ft	SP-SM	-8.5		85	S-33, SPT 3+3+5 REC=18", 100%		
						S-34, SPT 3+13+9 REC=18", 100%		
87.0	87.0 - 89.5 ft: POORLY GRADED SAND WITH SILT, medium grained sand, wet, gray, estimated 5 - 10% shell fragments, contains mica, weak HCl reaction, highly weathered shell fragments; layer of light gray cemented sands with shell fragments between 88 to 88.4 ft	SP-SM	-11.0			S-35, SPT 5+35+38 REC=18", 100%		
89.5	89.5 - 92.0 ft: POORLY GRADED SAND WITH SILT AND GRAVEL, fine to medium grained sand, wet, gray, estimated 15 - 25% fine gravel, estimated <5% shell fragments, contains mica, subangular gravel as cemented sands, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-13.5		90	S-36, SPT 7+46+50/4" REC=18", 115%		92.0 - 92.5 ft: hard drilling from 90 to 92 ft, easy drilling from 92 to 92.5 ft 92.5 - 95.0 ft: uniform drilling resistance from 92.5 to 93, hard drilling from 93 to 94.5 ft, break through hard material at 94.5 ft 95.0 - 98.5 ft: uniform drilling resistance, gray drilling fluid 98.5 - 103.5 ft: marsh funnel test performed, 40 sec drilling fluid
92.0		SP-SM	-16.0			S-37, SPT 7+50/6" REC=12", 100%		
94.5	92.0 - 94.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray, estimated 5 - 10% shell fragments, contains fine gravel, contains mica, subangular gravel as cemented sands, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-18.5		95	S-38, SPT 39+20+16 REC=18", 100%		
98.0	94.5 - 98.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated <5% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-22.0			S-39, SPT 6+9+13 REC=18", 100%		
	98.0 - 107.5 ft: POORLY GRADED				100			

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	SAND WITH SILT, fine grained sand, moist, gray, contains shell fragments, contains mica, no HCl reaction							98.5 - 103.5 ft: marsh funnel test performed, 40 sec drilling fluid (continued)
	103.5 ft: Changes to fine to medium grained sand, homogenous structure, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM			105	S-40, SPT 7+8+11 REC=18", 88%		103.5 - 108.5 ft: light gray drilling fluid
107.5	107.5 - 117.5 ft: SILTY SAND, fine grained sand, moist, gray, contains shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-31.5		110	S-41, SPT 6+9+14 REC=18", 100%		
	114.4 ft: Changes to contains highly weathered shell inclusions ~ 1 inch thick				115	S-42, SPT 5+7+10 REC=18", 100%		
117.5	117.5 - 122.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, contains mica, highly weathered shell fragments	SP-SM	-41.5		120	S-43, SPT 7+6+8 REC=18", 100%		118.5 - 123.5 ft: gray drilling fluid
122.5	122.5 - 132.5 ft: SILTY SAND, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-46.5		125	S-44, SPT 6+6+10 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	128.5 ft: Changes to contains shell fragments, weak HCl reaction	SM			130	S-45, SPT 5+8+11 REC=18", 100%		128.5 - 133.5 ft: no solid cuttings
132.5	132.5 - 138.0 ft: SANDY SILT, fine grained sand, moist, gray, contains mica, weak HCl reaction, homogenous structure	ML	-56.5		135	S-46, SPT 7+10+13 REC=18", 100%		
138.0	138.0 - 142.5 ft: SANDY SILT, fine grained sand, moist, gray, estimated <5% shell fragments, contains mica, weak HCl reaction, hard, highly weathered shell fragments	ML	-62.0		140	S-47, SPT 3+5+7 REC=18", 100%		
142.5	142.5 - 147.5 ft: SANDY SILT, fine grained sand, moist, gray, contains shell fragments, contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)	ML	-66.5		145	S-48, SPT 6+8+11 REC=18", 100%		
147.5	147.5 - 152.5 ft: SANDY SILT, fine grained sand, moist, brownish gray, contains mica, weak HCl reaction	ML	-71.5		150	S-49, SPT 6+10+11 REC=18", 100%		
	153.5 ft: Changes to hard, homogenous structure					S-50, SPT 5+8+12 REC=18", 100%		153.5 - 158.5 ft: no solid cuttings in drilling fluid

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-342**
Schnabel No.: 06120048
Sheet: 7 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
					155			153.5 - 158.5 ft: no solid cuttings in drilling fluid (continued)
						S-51, SPT 6+9+13 REC=18", 100%		
					160			
						S-52, SPT 7+9+11 REC=18", 100%		
					165			
						S-53, SPT 7+8+10 REC=7", 39%		
					170			
						S-54, SPT 5+8+14 REC=18", 100%		
					175			
						S-55, SPT 7+8+11 REC=18", 100%		
					180			

DRAFT

ML

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
182.5	182.5 - 187.0 ft: SANDY SILT, fine to medium grained sand, moist, brownish gray, contains mica, no HCl reaction, firm, homogenous structure	ML	-106.5					
		ML			185	S-56, SPT 6+8+8 REC=18", 100%		
187.0	187.0 - 197.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, brownish gray, contains shell fragments, contains mica, no HCl reaction, highly to moderately weathered shell fragments	SP-SM	-111.0		190	S-57, SPT 6+8+13 REC=18", 100%		
					195	S-58, SPT 4+7+13 REC=18", 100%		
197.5	197.5 - 207.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray, contains mica, no HCl reaction	SP-SM	-121.5		200	S-59, SPT 4+6+11 REC=18", 100%		198.5 - 203.5 ft: uniform resistance, gray drilling fluid
	203.5 ft: Changes to moist				205	S-60, SPT 5+7+13 REC=18", 100%		
207.5	207.5 - 212.5 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, no HCl reaction	SM	-131.5					

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
					-210	S-61, SPT 5+7+11 REC=18", 100%		
212.5	212.5 - 242.5 ft: SANDY SILT, fine grained sand, moist, gray, contains mica, no HCl reaction, hard, homogenous structure	SM	-136.5		-215	S-62, SPT 6+9+12 REC=18", 100%		213.5 - 215.0 ft: sandy silt cuttings
	218.5 ft: Changes to weak HCl reaction				-220	S-63, SPT 7+10+14 REC=18", 100%		
					-225	S-64, SPT 6+8+13 REC=18", 100%		
	228.5 ft: Changes to brownish gray	ML			-230	S-65, SPT 7+10+13 REC=18", 100%		
					-235	S-66, SPT 7+8+12 REC=18", 100%		

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-342
Schnabel No.: 06120048
Sheet: 10 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
		ML				S-67, SPT 6+9+16 REC=18", 100%		
			-240					
242.5	242.5 - 250.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm, homogenous structure	ML	-166.5			S-68, SPT 6+7+15 REC=17", 94%		243.5 - 248.5 ft: uniform drilling resistance, gray drilling fluid
			-245					
						S-69, SPT 9+11+16 REC=18", 100%		
250.0			-174.0		250			

Bottom of Boring at 250.0 ft.

NOTE: Negative groundwater depth denotes water level above ground surface (i.e. "negative depth"), but does not necessarily imply artesian conditions.



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-343**
Schnabel No.: 06120048
Sheet: 1 of 10

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: W. Wolfe

Schnabel Representative: D. Cepull

Equipment: CME-550

Method: 4-1/4" I.D. Hollow Stem Auger,
3 1/4" O.D. Tri-Cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/28/08 Finished: 7/31/08

Easting: 960306 ft Northing: 217039 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 83± (ft) Total Depth: 250.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/28	---	14.0'	13.0'	---
End of Day	7/28	6:00 PM	-1.0'	13.0'	---
Start of Day	7/29	7:00 AM	7.0'	13.0'	---
End of Day	7/29	2:20 PM	4.7'	13.0'	---
Start of Day	7/30	7:19 AM	7.5'	13.0'	---
End of Day	7/30	6:05 PM	-1.0'	13.0'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.4	0.0 - 0.4 ft: ORGANIC SOIL		82.8			S-1, SPT WOH/12"+2 RQD=10", 56%		0.0 ft: Advanced 4-1/4" I.D. HSA to 13.0 ft. Changes as noted below, see end of boring log for additional remarks.
4.5	0.4 - 4.5 ft: POORLY GRADED SAND WITH SILT, medium grained sand, moist, orangish brown, no HCl reaction, light licorice odor	SP-SM				S-2, SPT 1+2+3 RQD=5", 28%		
5.9	4.5 - 5.9 ft: POORLY GRADED SAND, medium grained sand, moist, orangish brown, no HCl reaction	SP	78.7		5	S-3, SPT 2+2+3 RQD=18", 100%		5.0 - 5.9 ft: jar labeled as S-3A
7.0	5.9 - 7.0 ft: SILTY SAND, medium grained sand, moist, orangish brown, no HCl reaction	SM	77.3			S-4, SPT 2+3+4 RQD=15", 83%		5.9 - 6.5 ft: jar labeled as S-3B
12.0	7.0 - 12.0 ft: POORLY GRADED SAND WITH SILT, medium grained sand, moist, orangish brown with mottles of white, no HCl reaction	SP-SM	76.2		10	S-5, SPT 7+1+2 RQD=18", 100%		
12.9	12.0 - 12.9 ft: SILTY SAND, medium grained sand, moist, orangish brown with mottles of white, no HCl reaction	SM	71.2			S-6, SPT 1+2+2 RQD=18", 100%		12.5 - 12.9 ft: jar labeled as S-6A
14.5	12.9 - 14.5 ft: POORLY GRADED SAND WITH SILT, medium grained sand, moist, gray, contains mica, no HCl reaction	SP-SM	70.3					12.9 - 14.0 ft: jar labeled as S-6B
17.5	14.5 - 17.5 ft: SILTY SAND, moist, gray, contains mica, no HCl reaction	SM	68.7		15	S-7, SPT WOH+1+3 RQD=16", 89%		13.0 ft: Switched to 3-1/4" O.D. tricone roller bit (mud rotary) and advanced to 250.0 ft. mixed 12 bags of bentonite to 110 gallons of water
19.0	17.5 - 19.0 ft: LEAN CLAY WITH SAND, fine grained sand, wet, gray, contains mica, no HCl reaction	CL	65.7			S-8, SPT 3+4+5 RQD=18", 100%		13.0 - 15.0 ft: Uniform drilling resistance, light brown drilling fluid, encountered water at 14.0 ft.
	19.0 - 22.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand,	SP-SM	64.2					

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04 22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	wet, gray, contains mica, no HCl reaction	SP-SM						18.5 - 19.0 ft: jar labeled as S-8A 19.0 - 20.0 ft: jar labeled as S-8B
22.5	22.5 - 27.0 ft: SANDY LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction	CL	60.7		25	S-9, SPT 2+3+4 RQD=18", 100%		23.5 - 28.5 ft: light gray drilling fluid
27.0	27.0 - 39.5 ft: LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction	CL	56.2		30	S-10, SPT 3+3+5 RQD=18", 100%		
	32.5 ft: Changes to firm	CL				S-11, SPT 3+4+4 RQD=18", 100%		32.5 - 35.0 ft: white drilling fluid
	35.0 ft: Changes to hard				35	S-12, SPT 4+5+6 RQD=18", 100%		
						S-13, SPT 4+7+9 RQD=18", 100%		
39.5	39.5 - 42.0 ft: CLAYEY SAND, fine grained sand, moist, gray, contains mica, no HCl reaction	SC	43.7		40	S-14, SPT 5+5+7 RQD=18", 100%		
42.0	42.0 - 43.0 ft: LEAN CLAY WITH SAND, fine grained sand, moist, gray, contains mica, no HCl reaction, hard	CL	41.2			S-15, SPT 4+9+10 RQD=18", 100%		42.5 - 43.0 ft: jar labeled as S-15A 43.0 - 44.0 ft: jar labeled as S-15B
43.0	43.0 - 44.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray, contains cemented sands, contains mica, no HCl reaction	SP-SM	40.2					
44.5	44.5 - 47.0 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, no HCl reaction	SM	38.7		45	S-16, SPT 8+13+19 RQD=18", 100%		45.0 - 47.5 ft: increased drilling resistance at 46.0 ft, light gray drilling fluid

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
47.0	47.0 - 48.0 ft: SILTY SAND, fine grained sand, moist, gray, contains cemented sands, contains mica, no HCl reaction	SM	36.2					
48.0	48.0 - 49.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, contains mica, highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	35.2			S-17, SPT 41+45+35 RQD=18", 100%		47.5 - 50.0 ft: uniform drilling resistance, light gray drilling fluid
49.5	49.5 - 52.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, no HCl reaction	SP-SM	33.7		50	S-18, SPT 38+50/3" RQD=9", 94%		47.5 - 48.0 ft: jar labeled as S-17A
52.5	52.5 - 57.8 ft: POORLY GRADED SAND WITH SILT, medium to coarse grained sand, angular particles, wet, gray, estimated 30 - 45% shell fragments, contains mica, highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil), coarse sand consists of shell fragments	SP-SM	30.7			S-19, SPT 50/3" RQD=3", 83%		48.0 - 49.0 ft: jar labeled as S-17B
57.8	57.8 - 64.5 ft: SANDY SILT, fine grained sand, moist, gray, contains mica, no HCl reaction	ML	25.4		55	S-20, SPT 23+18+19 RQD=12", 67%		
64.5	64.5 - 67.0 ft: SILTY SAND, wet, gray, contains cemented sands, contains mica, no HCl reaction (with shells), no HCl reaction (with cemented sands)	SM	18.7		60	S-21, SPT 7+8+6 RQD=15", 83%		57.5 - 57.8 ft: jar labeled as S-21A
67.0	67.0 - 69.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray with mottles of white, estimated 15 - 25% shell fragments, contains mica, strong HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	16.2			S-22, SPT 4+4+5 RQD=18", 100%		57.8 - 59.0 ft: jar labeled as S-21B
69.5	69.5 - 72.0 ft: SILTY SAND, fine to coarse grained sand, subrounded particles, wet, gray, estimated 15 - 25% shell fragments, contains mica, contains 0.1 ft thick cemented sand layer at 71.5 ft, highly weathered shell fragments, weak HCl reaction (shells), no HCl reaction (soil)	SM	13.7		65	S-23, SPT 4+4+5 RQD=18", 100%		
72.0	72.0 - 79.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated 5 - 10% shell	SP-SM	11.2		70	S-24, SPT 50/1" RQD=1", 83%		65.0 - 67.5 ft: uniform, but considerable drilling resistance, light gray drilling fluid
						S-25, SPT 7+7+10 RQD=18", 100%		67.5 - 69.5 ft: uniform drilling resistance
						S-26, SPT 14+24+20 RQD=18", 100%		69.5 - 70.0 ft: harder drilling
						S-27, SPT 5+4+7 RQD=11", 61%		70.0 - 72.5 ft: uniform drilling resistance

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
	fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)				75	S-28, SPT 4+7+7 RQD=18", 100%	
		SP-SM					
	77.5 ft: Changes to estimated 15 - 25% shell fragments					S-29, SPT 7+10+19 RQD=18", 100%	
79.5	79.5 - 84.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated <5% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	3.7		80	S-30, SPT 4+5+8 RQD=18", 100%	
	82.5 ft: Changes to contains shell fragments					S-31, SPT 5+5+8 RQD=18", 100%	
84.5	84.5 - 92.0 ft: POORLY GRADED SAND WITH SILT, wet, gray, contains shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-1.3		85	S-32, SPT 5+4+7 RQD=18", 100%	
	87.5 ft: Changes to homogenous structure					S-33, SPT 3+4+6 RQD=18", 100%	
		SP-SM			90	S-34, SPT 3+5+5 RQD=18", 100%	
92.0	92.0 - 94.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray with streaks of white, estimated 15 - 25% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil), contains shell layer at 93.0 ft	SP-SM	-8.8			S-35, SPT 5+10+13 RQD=18", 100%	
94.5	94.5 - 102.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, light gray, estimated 15 - 25% shell fragments, contains mica, moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-11.3		95	S-36, SPT 50/5" RQD=5", 104%	95.5 ft: hard drilling
	97.5 ft: Changes to estimated <5% shell fragments, estimated 15 - 25% cemented sands					S-37, SPT 50/2" RQD=2", 83%	97.0 ft: easy drilling
	100.0 ft: Changes to gray, estimated <5% shell fragments, contains				100	S-38, SPT 50/5"	98.5 ft: soft drilling 99.5 ft: hard drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
102.0	cemented sands, sands as gravel sized fragments, weak HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-18.8			RQD=5", 104%		102.0 ft: softer drilling 102.5 - 108.5 ft: uniform drilling resistance, marsh funnel test performed, 50 sec drilling fluid
102.0 - 107.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, contains shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM				105	S-39, SPT 6+12+20 RQD=18", 100%		
107.0	107.0 - 112.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-23.8		110	S-40, SPT 5+7+10 RQD=18", 100%		
112.0	112.0 - 122.5 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, no HCl reaction, homogenous structure	SM	-28.8		115	S-41, SPT 5+7+10 RQD=18", 100%		
					120	S-42, SPT 7+7+10 RQD=18", 100%		
122.5	122.5 - 137.0 ft: SILTY SAND, fine grained sand, moist, gray, contains shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-39.3		125	S-43, SPT 6+10+11 RQD=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	128.5 ft: Changes to estimated 5 - 10% shell fragments	SM			130	S-44, SPT 5+9+21 RQD=18", 100%		
	133.5 ft: Changes to shell fragments, contains shell layers at 134.2 ft				135	S-45, SPT 6+7+11 RQD=18", 100%		
137.0	137.0 - 142.5 ft: SANDY SILT, fine grained sand, moist, gray, contains mica, weak HCl reaction, hard, homogenous structure	ML	-53.8		140	S-46, SPT 6+9+13 RQD=18", 100%		
142.5	142.5 - 147.5 ft: SILTY SAND, fine grained sand, moist, gray, estimated <5% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), weak HCl reaction (with soil)	SM	-59.3		145	S-47, SPT 5+6+12 RQD=18", 100%		
147.5	147.5 - 192.0 ft: SANDY SILT, fine grained sand, moist, gray, contains mica, weak HCl reaction	ML	-64.3		150	S-48, SPT 5+8+9 RQD=18", 100%		
	153.5 ft: Changes to no HCl reaction, homogenous structure					S-49, SPT 6+6+10 RQD=18", 100%		
								143.5 - 148.5 ft: uniform drilling resistance, light gray drilling fluid

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-343**
Schnabel No.: 06120048
Sheet: 7 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	158.5 ft: Changes to weak HCl reaction, firm	ML			155			
						S-50, SPT 6+8+10 RQD=18", 100%		158.5 - 163.5 ft: gray drilling fluid
					160			
	163.5 ft: Changes to weak HCl reaction, hard					S-51, SPT 8+9+10 RQD=18", 100%		
					165			
		ML				S-52, SPT 5+9+11 RQD=18", 100%		
					170			
						S-53, SPT 7+11+12 RQD=15", 83%		
					175			
		ML				S-54, SPT 6+9+11 RQD=18", 100%		
					180			

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
							183.0 - 185.0 ft: sandy silt cuttings
		ML			S-55, SPT 4+8+9 RQD=18", 100%		
					S-56, SPT 6+9+12 RQD=18", 100%		
192.0	192.0 - 197.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, gray, estimated 5- - 10% shell fragments, contains mica, moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-108.8		S-57, SPT 8+12+15 RQD=18", 100%		
197.5	197.5 - 202.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, contains shell fragments, contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-114.3		S-58, SPT 4+7+11 RQD=18", 100%		
202.5	202.5 - 207.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, weak HCl reaction, homogenous structure	SP-SM	-119.3		S-59, SPT 5+6+11 RQD=18", 100%		
207.5	207.5 - 217.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, contains mica, no HCl	SP-SM	-124.3				

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	reaction				S-60, SPT 4+6+9 RQD=18", 100%		
					210		
	213.5 ft: Changes to homogenous structure	SP-SM			S-61, SPT 5+5+10 RQD=18", 100%		213.5 - 218.5 ft: uniform drilling resistance, gray drilling fluid
					215		
217.5	217.5 - 227.5 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, weak HCl reaction, homogenous structure		-134.3		S-62, SPT 6+7+10 RQD=18", 100%		
					220		
		SM			S-63, SPT 8+12+13 RQD=13", 72%		
					225		
227.5	227.5 - 232.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, contains mica, weak HCl reaction	SP-SM	-144.3		S-64, SPT 7+8+12 RQD=18", 100%		228.5 - 233.5 ft: brownish gray drilling fluid
					230		
232.5	232.5 - 242.5 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, no HCl reaction	SM	-149.3		S-65, SPT 7+9+13 RQD=18", 100%		
					235		

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-343**
Schnabel No.: 06120048
Sheet: 10 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
242.5	242.5 - 250.0 ft: POORLY GRADED SAND WITH SILT, moist, brownish gray, contains mica, weak HCl reaction, homogenous structure	SM	-159.3		S-66, SPT 6+7+14 RQD=18", 100%		243.5 - 248.5 ft: uniform drilling resistance, brownish gray drilling fluid, no solid cuttings
		SP-SM			S-67, SPT 5+18+13 RQD=18", 100%		
250.0			-166.8		S-68, SPT 7+10+13 RQD=18", 75%		

Bottom of Boring at 250.0 ft.

NOTE: Negative groundwater depth denotes water level above ground surface (i.e. "negative depth"), but does not necessarily imply artesian conditions.

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-344**
Schnabel No.: 06120048
Sheet: 1 of 10

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: W. Wolfe

Schnabel Representative: D. Cepull

Equipment: CME-550; AWJ/NWJ Rods

Method: 6 1/4" I.D. Hollow Stem Auger
3 1/4" O.D. Tri-Cone Roller Bit,
6" O.D. Tri-Cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/16/08 Finished: 7/24/08

Easting: 960358 ft Northing: 216976.8 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 72.3 (ft) Total Depth: 250.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/16	8:59 AM	8.0'	8.0'	---
End of Day	7/16	6:00 PM	1.0'	8.0'	---
Start of Day	7/17	7:30 AM	3.0'	8.0'	---
End of Day	7/17	6:08 PM	1.5'	8.0'	---
Start of Day	7/18	7:15 AM	20.0'	8.0'	---
End of Day	7/18	2:00 PM	1.0'	8.0'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.7	0.0 - 0.7 ft: Rootmat and topsoil, roots		71.6			S-1, SPT 1+1+1 REC=11", 61%		0.0 - 2.5 ft: Advanced 6 inches HSA auger to 8.0 ft, 0.0 to 2.5 ft, interval uniform drilling resistance, light brown cuttings. Changes as noted below. See end of boring log for additional remarks
	0.7 - 4.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, light brown, contains roots							
	2.5 ft: Changes to medium to coarse grained sand, subrounded particles, contains gravel, rounded gravel fracture	SP-SM				S-2, SPT 2+2+1 REC=14", 78%		
4.5	4.5 - 7.0 ft: CLAYEY SAND, fine to medium grained sand, moist, light orangish brown, no HCl reaction, homogenous structure	SC	67.8		5	S-3, SPT 1+2+3 REC=11", 61%		
7.0	7.0 - 8.4 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, orangish brown	SP-SM	65.3			S-4, SPT 2+2+2 REC=17", 94%		7.5 - 8.4 ft: jar labeled as S-4A
8.4	8.4 - 9.5 ft: LEAN CLAY WITH SAND, fine grained sand, moist, light orangish brown and light brown, no HCl reaction, soft	CL	63.9					8.0 ft: encountered groundwater switched from 6 1/4 inch HSA to 3 1/4 inch O.D. tricone roller bit (mud rotary)
9.5	9.5 - 12.0 ft: LEAN CLAY WITH SAND, fine grained sand, moist, gray, contains mica, no HCl reaction, soft	CL	62.8		10	S-5, SPT 2+3+3 REC=18", 100%		8.0 - 10.0 ft: Advanced 3 inch O.D. tricone roller marsh funnel test performed = 45 sec. bit to 178.5 ft. 8.0 to 10.0 ft internal uniform drilling resistance, light brown drilling fluid.
12.0	12.0 - 19.2 ft: LEAN CLAY WITH SAND, fine grained sand, moist, gray, contains mica, no HCl reaction, 0.5 inch layer of silty sand between 13.0 to 13.1 ft	CL	60.3		15	S-6, SPT 3+2+4 REC=18", 100%		8.4 - 9.0 ft: jar labeled as S-4B
						S-7, SPT 3+3+4 REC=18", 100%		15.0 ft: drilling fluid changes to gray
19.2	19.2 - 22.0 ft: POORLY GRADED WITH SILT, fine grained sand, moist,	SP-SM	53.1			S-8, SPT 4+10+11 REC=15", 83%		15.1 - 18.5 ft: light to gray drilling fluid 18.5 - 19.2 ft: jar labeled S-8A

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	gray, contains mica, no HCl reaction	SP-SM						19.2 - 20.0 ft: jar labeled S-8B
22.0	22.0 - 27.0 ft: LEAN CLAY WITH SAND, fine grained sand, moist, gray, no HCl reaction, hard, homogenous structure	CL	50.3			S-9, SPT 4+6+9 REC=18", 100%		18.5 - 22.5 ft: uniform drilling resistance light gray drilling fluid (continued)
					25	S-10, SPT 4+6+7 REC=18", 100%		22.5 - 25.0 ft: gray boring sidewalls "collapsed" between 0 - 25.0 ft, 6 inches 0.0 tricone roller bit used to ream boring between 8 to 25 ft
27.0	27.0 - 32.0 ft: SILTY SAND, fine grained sand, moist, gray, no HCl reaction, homogenous structure		45.3			S-11, SPT 7+7+8 REC=18", 100%		25.0 - 27.5 ft: switched to 3/14 inch tricone roller bit, uniform drilling resistance, light gray drilling fluid
	29.5 ft: Changes to contains mica	SM			30	S-12, SPT 3+4+9 REC=18", 100%		
32.0	32.0 - 34.5 ft: POORLY GRADED SAND WITH SILT, moist, gray, contains mica, no HCl reaction, homogenous structure	SP-SM	40.3			S-13, SPT 9+14+26 REC=18", 100%		32.5 - 35.0 ft: slightly increased drilling resistance between 34.0 and 35.0 ft
34.5	34.5 - 37.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, contains mica, highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	37.8		35	S-14, SPT 33+38+50 REC=18", 100%		
37.0	37.0 - 42.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, no HCl reaction	SP-SM	35.3			S-15, SPT 50/6" REC=6", 100%		
	40.0 ft: Changes to wet				40	S-16, SPT 22+50/5" REC=11", 102%		
42.0	42.0 - 47.0 ft: WELL GRADED SAND WITH SILT, fine to coarse grained sand, subangular particles, moist, gray with speckles of white, contains mica, estimated 15 - 25% shell fragments, highly weathered shell, weak HCl reaction (with shells), no HCl reaction (with shells)	SW-SM	30.3			S-17, SPT 33+32+40 REC=18", 100%		
	45.0 ft: Changes to wet, gray with bands of white				45	S-18, SPT 8+14+13 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
47.0	47.0 - 52.0 ft: SANDY SILT, fine grained sand, moist, gray, contains mica, no HCl reaction, firm, contains 0.1 ft thick highly weathered shell fragment layer at 48.2 ft	ML	25.3			S-19, SPT 3+5+5 REC=18", 100%		
	50.0 ft: Changes to contains shell fragments, contains mica, no HCl reaction (with shells or soil)				50	S-20, SPT 3+4+4 REC=18", 100%		
52.0	52.0 - 54.5 ft: SANDY SILT, fine grained sand, moist, gray, contains mica, no HCl reaction, contains 0.1 inch layer of fine cemented sand at 53.1 ft	ML	20.3			S-21, SPT 16+50/5" REC=11", 102%		52.0 ft: rod chatter
54.5	54.5 - 57.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, no HCl reaction (with shells or soil)	SP-SM	17.8		55	S-22, SPT 15+6+7 REC=18", 100%		52.5 - 55.0 ft: rod chatter throughout entire interval. New batch of drilling fluid mixed for hole, marsh funnel test performed 45 sec drilling fluid
57.0	57.0 - 59.5 ft: SILTY SAND WITH GRAVEL, fine grained sand, wet, gray, contains mica, estimated 15 - 25% shell fragments, fine gravel sized highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	15.3			S-23, SPT 4+43+43 REC=18", 100%		55.0 - 57.5 ft: uniform drilling resistance, light gray drilling fluid
59.5	59.5 - 64.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	12.8		60	S-24, SPT 7+4+4 REC=18", 100%		
	62.5 ft: Changes to moist, contains 0.1 ft shell fragment layers at 62.8 and 63.2 ft					S-25, SPT 4+5+5 REC=18", 100%		
64.5	64.5 - 67.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray and white, estimated 15 - 25% shell fragments, contains mica, white shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	7.8		65	S-26, SPT 5+8+9 REC=18", 100%		65.0 - 67.5 ft: harder drilling from 67.0 to 67.5 ft
67.5	67.5 - 72.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated <5% shell fragments, highly weathered shell fragments, no HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	4.8			S-27, SPT 5+5+7 REC=18", 100%		67.5 - 70.0 ft: uniform drilling resistance, light gray drilling fluid
	70.0 ft: Changes to contains shell fragments				70	S-28, SPT 5+5+8 REC=18", 100%		
72.0	72.0 - 79.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, contains shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	0.3			S-29, SPT 4+4+5 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	75.0 ft: Changes to no HCl reaction (with shells or soil)	SP-SM			75 S-30, SPT 4+3+5 REC=18", 100%		
79.5	79.5 - 82.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, weak HCl reaction (with shells), no HCl reaction (soil), 0.1 ft thick shell layer at 81.0 ft	SP-SM	-7.2		80 S-31, SPT 3+4+4 REC=17", 94%		
82.0	82.0 - 87.0 ft: POORLY GRADED SAND WITH SILT AND GRAVEL, fine gravel, subangular particles, wet, gray, estimated 15 - 25% shell fragments, fine gravel sized highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil), fine gravel is shell fragments	SP-SM	-9.7		85 S-32, SPT 5+7+12 REC=18", 100%		81.0 ft: shells oriented 45 degrees to vertical
87.0	87.0 - 89.5 ft: POORLY GRADED SAND WITH SILT AND GRAVEL, fine grained sand, wet, gray, estimated 15 - 25% shell fragments, contains mica, fine gravel sized highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil), fine gravel is shell fragments	SP-SM	-14.7		85 S-33, SPT 11+50/6" REC=12", 100%		
89.5	89.5 - 92.0 ft: SILTY SAND, fine grained sand, wet, gray, contains shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-17.2		90 S-34, SPT 13+47+12 REC=18", 100%		
92.0	92.0 - 102.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, contains shell fragments, contains mica, highly weathered shell fragments, no HCl reaction (with shells or soil)	SP-SM	-19.7		90 S-35, SPT 14+32+33 REC=18", 100%		92.5 - 98.5 ft: marsh funnel test performed, 43 sec drilling fluid
	98.5 ft: Changes to moist				95 S-36, SPT 9+12+12 REC=18", 100%		
					100 S-37, SPT 6+8+9 REC=18", 100%		
							98.5 - 103.5 ft: uniform drilling resistance, light gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
102.5	102.5 - 107.5 ft: SILTY SAND, fine grained sand, moist, gray, contains shell fragments, contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-30.2				98.5 - 103.5 ft: uniform drilling resistance, light gray drilling fluid (continued)
		SM			105	S-39, SPT 6+10+12 REC=18", 100%	
107.5	107.5 - 117.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, contains shell fragments, contains mica, no HCl reaction (with shells), weak HCl reaction (with soil)		-35.2				
		SP-SM			110	S-40, SPT 8+8+9 REC=18", 100%	
	113.5 ft: Changes to estimated 5 - 10% shell fragments, highly weathered shell fragments, weak HCl reaction (with shells and soil), shell inclusion at 114.6 ft				115	S-41, SPT 6+5+7 REC=18", 100%	
117.5	117.5 - 127.0 ft: SILTY SAND, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, contains mica, weak HCl reaction (with shells and soil), white shell inclusion at 119.7 ft		-45.2				
		SM			120	S-42, SPT 6+8+12 REC=18", 100%	
	123.5 ft: Changes to contains shell fragments, homogenous structure				125	S-43, SPT 5+8+10 REC=18", 100%	
127.0	127.0 - 132.5 ft: SANDY SILT, fine grained sand, moist, grayish brown,	ML	-54.7				

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	contains mica, weak HCl reaction, hard	ML			130	S-44, SPT 7+9+11 REC=18", 100%		
132.5	132.5 - 137.5 ft: SANDY SILT, fine grained sand, moist, grayish brown, contains shell fragments, contains mica, weak HCl reaction (with shells), weak HCl reaction (with soil)	ML	-60.2		135	S-45, SPT 4+4+8 REC=18", 100%		
137.5	137.5 - 181.0 ft: SANDY SILT, fine grained sand, moist, grayish brown, contains mica, no HCl reaction	ML	-65.2		140	S-46, SPT 5+7+8 REC=18", 100%		
	143.5 ft: Changes to weak HCl reaction	ML			145	S-47, SPT 6+8+8 REC=18", 100%		
					150	S-48, SPT 6+8+12 REC=18", 100%		
						S-49, SPT 6+7+11 REC=18", 100%		

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-344**
Schnabel No.: 06120048
Sheet: 7 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
155								
						S-50, SPT 6+8+9 REC=18", 100%		
160								
						S-51, SPT 6+7+9 REC=18", 100%		
165								
	163.5 ft: Changes to homogenous structure							163.5 - 168.5 ft: uniform drilling resistance, gray drilling fluid
						S-52, SPT 6+7+9 REC=18", 100%		
170								
	168.5 ft: Changes to firm, homogenous structure							
						S-53, SPT 5+7+10 REC=8", 44%		
175								
	173.5 ft: Changes to hard							
						S-54, SPT 7+8+10 REC=18", 100%		
180								
								178.5 - 181.5 ft: switched to O.D. tricone roller bit. Reamed hole with 6 inch O.D. tricone roller bit between 25.0 and 151.5 ft
181.0	181.0 - 191.0 ft: SILTY SAND, fine to medium grained sand, moist, grayish	SM	-108.7					

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
	gray, contains mica, estimated 5 - 10% shell fragments, weak HCl reaction (with shells), weak HCl reaction (with soil) 183.5 ft: Changes to gray, contains 0.1 ft thick brown cemented sand layer at 184.2 ft.	SM			UD-1, UNDIST REC=16", 67%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	181.5 - 183.5 ft: pushed pitcher sampler 24 inches for 28.2 sec; 16 inch recovery, (continued)
					S-55, SPT 6+11+22 REC=16", 89%		183.5 - 188.5 ft: Switched to 3 1/4 inch O.D. tricone roller bit and advanced roller bit to 188.5 ft, uniform drilling resistance, gray drilling fluid
					S-56, SPT 4+7+18 REC=18", 100%		188.5 ft: switched to 6 inch O.D. tricone roller bit; reamed hole with 6 inch O.D. tricone roller bit between 183.5 and 191.5 ft
191.0	191.0 - 204.0 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, weak HCl reaction 193.5 ft: Changes to no HCl reaction, homogenous structure	SM	-118.7		UD-2, UNDIST REC=23", 96%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	193.0 - 198.5 ft: switched to 3 1/4 O.D. tricone roller bit and advanced roller bit to 198.5 ft, gray silty sand cuttings
					S-57, SPT 3+5+7 REC=16", 89%		
					S-58, SPT 4+5+9 REC=10", 56%		198.5 - 201.5 ft: switched to 6 inch O.D. tricone roller bit and advanced tricone roller bit to 206 ft; reamed hole between 193.5 and 201.5 ft
	198.5 ft: Changes to weak HCl reaction				UD-3, UNDIST REC=12", 50%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	201.5 - 203.5 ft: pushed pitcher sample 24", in 38.4 sec, 12" recovery, sample placed in jar and labeled as UD-3
	201.5 ft: Changes to weak HCl reaction				UD-4, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	204.0 - 206.0 ft: pushed pitcher sample 24 inches. 24 inch recovery
204.0	204.0 - 217.5 ft: SILTY SAND, fine grained sand, moist, contains mica, no HCl reaction, homogenous structure	SM	-131.7		S-59, SPT 5+8+13 REC=18", 100%		206.0 ft: switched to 3 1/4 inch tricone roller bit and advanced roller bit to 208.5 ft

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
					210	S-60, SPT 4+7+9 REC=18", 100%		208.5 ft: switched to 6 inch O.D. tricone roller bit and advanced roller bit to 213.5 ft; reamed hole between 206.0 to 211.5 ft
						UD-5, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	211.5 - 213.5 ft: pushed pitcher sampler 24 inches
		SM			215	S-61, SPT 5+9+12 REC=18", 100%		213.5 ft: switched to 3 1/4 inch O.D. tricone roller bit and advanced roller bit to 218.5 ft, silty sand cuttings
217.5	217.5 - 233.5 ft: SANDY SILT, fine grained sand, moist, contains mica, weak HCl reaction, firm, homogenous structure		-145.2		220	S-62, SPT 6+7+11 REC=18", 100%		218.5 ft: switched to 6 inch O.D. tricone roller bit and advanced roller bit to 221.5 ft; reamed hole from 213.5 to 221.5 ft
						UD-6, UNDIST	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	221.5 - 223.5 ft: pushed pitcher sampler 24 inches in 1 minute 22 sec, 500 lb of pressure required to push tube (hard material), 19.5 inch recovery
	223.5 ft: Changes to no HCl reaction, firm, homogenous structure				225	S-63, SPT 5+7+11 REC=18", 100%		223.5 ft: switched to 3 1/4 inch O.D. tricone roller bit and advanced roller bit to 228.5 ft, no solid cuttings
		ML			230	S-64, SPT 5+8+12 REC=18", 100%		228.5 ft: switched to 6 inch O.D. tricone roller bit and advanced roller bit to 231.5 ft reamed hole between 223.5 and 231.5 ft
	228.5 ft: Changes to soft					UD-7, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	231.5 - 233.5 ft: pushed pitcher tube sample 24 inches in 32.97 sec, 24 inch recovery
	231.5 ft: Changes to weak HCl reaction				235	S-65, SPT 5+8+14 REC=16", 89%		233.5 ft: switched to 3 1/4 O.D. tricone roller bit and advanced roller bit to 238.3
233.5	233.5 - 243.5 ft: SANDY SILT, fine grained sand, moist, brownish gray, contains mica, weak HCl reaction, hard, homogenous structure	ML	-161.2					

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	238.5 ft: Changes to grayish brown, no HCl reaction	ML						ft 233.5 - 238.5 ft: Advanced 3 1/4 inch O.D. tricone roller bit to 238.3 ft, uniform drilling resistance, gray drilling fluid (continued)
	241.5 ft: Changes to brownish gray, weak HCl reaction							238.5 ft: switched to 6 inch O.D. tricone roller bit and advanced roller bit to 244.5 ft, reamed hole between 233.5 and 241.5 ft
243.5	243.5 - 250.0 ft: SANDY SILT, fine grained sand, moist, brownish gray, contains mica, weak HCl reaction, slight organic odor	ML	-171.2				PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	241.5 - 243.5 ft: pushed pitcher tube sample 24 inches in 52.2 sec, 24 inch recovery
					240	S-66, SPT 7+8+12 REC=18", 100%		243.5 ft: switched to 3 1/4 O.D. tricone roller bit and advanced roller bit to 248.5 ft
					245	S-67, SPT 6+10+17 REC=18", 100%		
						S-68, SPT 7+9+13 REC=18", 75%		
250.0			-177.7		250			

Bottom of Boring at 250.0 ft.

NOTE: Negative groundwater depth denotes water level above ground surface (i.e. "negative depth"), but does not necessarily imply artesian conditions.

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-345
Schnabel No.: 06120048
Sheet: 1 of 10

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: P. Patrick/K. Bell

Equipment: CME-75 (Truck); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/31/08 **Finished:** 8/6/08

Easting: 960392.2 ft **Northing:** 217096.7 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 69.3 (ft) **Total Depth:** 250.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/31	---	13.5'	13.5'	---
Start of Day	8/1	7:30 AM	7.0'	13.5'	---
Start of Day	8/4	8:00 AM	22.0'	13.5'	---
Start of Day	8/5	7:10 AM	13.2'	13.5'	---
Start of Day	8/6	7:15 AM	28.0'	13.5'	---
Completion	8/6	12:00 PM	28.5'	13.5'	---

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
2.0	0.0 - 2.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, yellowish red, estimated <5% fine to coarse gravel, estimated <5% organics, no HCl reaction, homogenous structure	SP-SM	67.3			S-1, SPT 2+2+2 REC=16", 89%		0.0 - 2.5 ft: advanced 4 1/4" ID auger to 10 ft; 0 to 2.5 ft interval: sand with silt cuttings, contains root fragments, hard drilling; changes as noted below, see end of boring log for additional remarks
4.5	2.0 - 4.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, yellowish red, estimated <5% mica, estimated <5% roots, no HCl reaction, homogenous structure, contains large (0.5 inch) gray particles, probably grout that was inside of the augers	SP-SM	64.8			S-2, SPT 3+2+3 REC=18", 100%		
5.8	4.5 - 5.8 ft: SILTY SAND, fine grained sand, moist, pinkish gray, estimated 5 - 10% fine to coarse gravel, strong HCl reaction, homogenous structure	SM	63.5		5	S-3, SPT 4+3+3 REC=13", 72%		5.0 - 7.5 ft: hand drilling 5.0 - 5.8 ft: jar labeled as S-3A 5.8 - 6.5 ft: jar labeled as S-3B
9.5	5.8 - 9.5 ft: SILTY SAND, fine grained sand, moist, olive brown and yellowish red, strong HCl reaction, homogenous structure	SM	59.8			S-4, SPT 3+4+3 REC=16", 89%		
12.5	9.5 - 12.5 ft: SANDY LEAN CLAY, fine grained sand, moist, olive brown with mottles of yellowish red, weak HCl reaction, lensed, clayey sand layers (1 - 3 inches thick), clayey sand tends to be yellowish red while sandy lean clay tends to be olive brown	CL	56.8		10	S-5, SPT 4+5+6 REC=18", 100%		10.0 ft: driller switched to 3 1/2 OD tricone roller bit (mud rotary) and advanced to 250 ft 10.0 - 13.5 ft: olive brown drilling fluid, easy drilling silt clumps in cuttings
14.0	12.5 - 14.0 ft: SANDY LEAN CLAY, fine grained sand, wet, grayish purple, no HCl reaction, firm, homogenous structure	CL	55.3			S-6, SPT 2+3+3 REC=18", 100%		13.5 - 16.0 ft: gray drilling fluid 13.5 - 14.0 ft: jar labeled as S-6A 14.0 - 15.0 ft: jar labeled as S-6B
16.5	14.0 - 16.5 ft: CLAYEY SAND, fine grained sand, wet, grayish purple, estimated <5% mica, no HCl reaction, homogenous structure	SC	52.8		15	S-7, SPT 3+3+4 REC=18", 100%		16.0 - 18.5 ft: easy drilling 16.0 - 16.5 ft: jar labeled as S-7A 16.5 - 17.5 ft: jar labeled as S-7B
18.0	16.5 - 18.0 ft: SANDY LEAN CLAY, fine grained sand, wet, grayish purple, no HCl reaction, hard, homogenous structure	CL	51.3			S-8, SPT 3+4+5 REC=18", 100%		
	18.0 - 23.0 ft: FAT CLAY, wet, grayish pink, no HCl reaction, hard, homogenous structure	CH						

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
21.0	21.0 ft: Changes to lensed, contains small pockets (< 0.5 in diameter) of yellowish red sands	CH				S-9, SPT 4+5+7 REC=18", 100%		21.0 - 23.5 ft: harder drilling
23.0	23.0 - 25.5 ft: LEAN CLAY, wet, grayish purple, no HCl reaction, hard, homogenous structure, contains 0.5 inch layer of CLAYEY SAND (SC), wet, grayish purple at 24.8 ft	CL	46.3			S-10, SPT 5+8+9 REC=18", 100%		23.5 - 26.0 ft: uniform drilling resistance, gray drilling fluid
25.5	25.5 - 26.5 ft: CLAYEY SAND, fine grained sand, wet, grayish purple, no HCl reaction, homogenous structure	SC	43.8					
26.5	26.5 - 28.0 ft: SILTY SAND, fine grained sand, wet, grayish purple, no HCl reaction, homogenous structure	SM	42.8			S-11, SPT 3+3+5 REC=18", 100%		26.0 - 28.5 ft: smooth drilling 26.0 - 26.5 ft: jar labeled as S-11A
28.0	28.0 - 30.5 ft: SILTY SAND, fine to medium grained sand, moist, dark gray, contains mica, no HCl reaction, homogenous structure, weak cementation from 28.5 to 30 ft	SM	41.3			S-12, SPT 7+10+13 REC=17", 94%		26.5 - 27.5 ft: jar labeled as S-11B 27.5 ft: Schnabel representative switched from P. Patrick to K. Bell
30.5	30.5 - 33.0 ft: SILTY SAND, fine to medium grained sand, moist, dark gray, estimated <5% shell fragments, fine to medium sand size, highly weathered shell	SM	38.8			S-13, SPT 14+50/6" REC=12", 100%		28.5 - 31.0 ft: uniform drilling resistance, harder drilling
33.0	31.8 ft: Changes to light gray, estimated <5% fine gravel, weak cementation, fine gravel as cemented sand, weak HCl reaction with shells, no HCl reaction with soil		36.3			S-14, SPT 33+50/4" REC=9", 83%		31.0 - 33.5 ft: slight rig chatter at 33 ft (possible cemented sand)
	33.0 - 37.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, light gray, estimated 5 - 10% shells, fine sand sized highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil, shells decrease with depth	SP-SM				S-15, SPT 50/5" REC=5", 83%		33.5 - 36.0 ft: hard drilling
37.5	37.5 - 40.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray and light gray, estimated 50 - 100% shells, weak HCl reaction, fine to medium sand size moderate to highly weathered shells	SP-SM	31.8			S-16, SPT 13+11+19 REC=11", 61%		
40.5	40.5 - 43.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, light gray, estimated 15 - 25% shells, weak HCl reaction, fine to coarse sand size, fresh to highly weathered shells, angular coarse sand size shells, contains a 1-inch layer of SANDY SILT (ML), fine sand, moist, dark gray, est < 5% shells, weak HCl with soil and shells, soft at 42.4 ft	SP-SM	28.8			S-17, SPT 28+29+13 REC=11", 61%		38.5 - 41.0 ft: softer drilling at 39 ft, clumps of silty sand, fine to medium sand sized shell cuttings
43.0	43.0 - 48.0 ft: SANDY LEAN CLAY, fine grained sand, moist, light gray, estimated <5% shells, contains mica, weak HCl reaction, firm to hard, homogenous structure, fine to medium sand size, moderate to highly weathered shells	CL	26.3			S-18, SPT 5+5+7 REC=16", 89%		41.0 - 43.5 ft: steadily easier drilling with depth
						S-19, SPT 3+3+5 REC=18", 100%		43.5 - 46.0 ft: uniform drilling resistance, smooth drilling, light gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
48.0	46.0 ft: Changes to estimated <5% organics, (organics are possible cattails), fine sand size highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil	CL	21.3					46.0 - 48.5 ft: gray drilling fluid, cuttings are clayey sand, fine to medium sand, fine to medium sand sized shell cuttings (continued)
50.5	48.0 - 50.5 ft: CLAYEY SAND, fine to medium grained sand, moist, contains mica, estimated <5% shells, homogenous structure, fine to medium sand size, fresh to highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil	SC	18.8		50	S-20, SPT 3+4+4 REC=18", 100%		48.5 - 51.0 ft: heavy rig chatter and hard drilling resistance from 50.5 to 51 ft (possible cemented layer)
53.0	50.5 - 53.0 ft: CLAYEY SAND, fine to medium grained sand, moist, gray and brownish gray, estimated <5% shells, estimated 5 - 10% fine gravel, fine to medium sand size fresh to highly weathered shells fine gravel as cemented sand, subangular to subrounded fine gravel, weak HCl reaction with shells, no HCl reaction with cemented sand and soil, moderate to strong cementation	SC	16.3			S-21, SPT 50/6" REC=6", 100%		51.0 - 53.5 ft: hard drilling from 51 to 53 ft, soft drilling from 53 to 53.5 ft
55.5	53.0 - 55.5 ft: SILTY SAND, fine to medium grained sand, wet, light brownish gray, estimated 5 - 10% shells, estimated <5% fine gravel, fine sand to fine angular gravel size fresh to highly weathered shells, fine gravel as cemented sand, subrounded to subangular fine gravel, weak HCl reaction with shells, no HCl reaction with soil	SM	13.8		55	S-22, SPT 5+10+32 REC=16", 89%		53.5 - 56.0 ft: heavy rig chatter at 55.5 ft (possible cemented sand)
60.5	55.5 - 60.5 ft: SILTY SAND, fine to medium grained sand, wet, light olive gray and gray, estimated 15 - 25% shells, fine to angular coarse sand size, fresh to highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil	SM	8.8		60	S-23, SPT 9+6+8 REC=10", 56%		
	58.5 ft: Changes to olive gray and gray, estimated <5% shells, fine to medium sand size, fresh to highly weathered shells					S-24, SPT 4+5+7 REC=18", 100%		
	60.5 - 75.5 ft: SILTY SAND, fine to medium grained sand, wet, dark gray and gray, estimated 5 - 10% shells, fine sand to angular fine gravel size fresh to highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil				65	S-25, SPT 7+8+11 REC=17", 94%		
	63.5 ft: Changes to shell size increases with depth					S-26, SPT 5+8+7 REC=15", 83%		
	66.0 ft: Changes to estimated <5% shells, homogenous structure, fine to medium sand size, moderate to highly weathered shells					S-27, SPT 6+6+10 REC=18", 100%		
	68.5 ft: Changes to olive gray and gray				70	S-28, SPT 4+5+8 REC=18", 100%		
	71.0 ft: Changes to gray and light gray					S-29, SPT 4+5+7 REC=18", 100%		68.5 ft: driller desanded mud-tub, driller added 50 gallons of clean water with 1/2 bag of bentonite to drilling fluid, driller flushed hole to prevent collapse over the weekend
	73.5 ft: Changes to estimated <5%					S-30, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
75.5	shells, fine sand size, highly weathered shells	SM	-6.2		75	4+4+7 REC=18", 100%		
78.0	75.5 - 78.0 ft: SILTY SAND, fine to medium grained sand, wet, gray, estimated <5% shell fragments, fine sand size highly weathered shells, weak HCl reaction with shells and soil, weak cementation from 77.3 to 77.5	SM	-8.7			S-31, SPT 4+16+14 REC=10", 56%		76.0 - 78.5 ft: slight rig chatter at 77 ft (possible cemented sand)
83.0	78.0 - 83.0 ft: SANDY SAND WITH GRAVEL, fine to medium grained sand, wet, gray and light gray, estimated 5 - 10% shells, weak HCl reaction, fine gravel (subrounded to subangular fine gravel), fine to angular coarse sand size, fresh to highly weathered shells, moderate to strong cementation (fine gravels), cementation (fine gravel), cemented sands increase with depth 81.0 ft: Changes to estimated 15 - 25% shells, weak HCl reaction with shells, no HCl reaction with cemented sand and soil	SM	-13.7		80	S-32, SPT 16+50/5" REC=11", 102%		81.0 - 83.5 ft: slight rig chatter throughout, hard drilling, light gray drilling fluid
88.0	83.0 - 88.0 ft: SILTY SAND, fine to medium grained sand, wet, gray and light gray, estimated 5 - 10% shells, estimated <5% fine gravel, fine to angular coarse sand size, fresh to highly weathered shells, fine gravel as cemented sand, weak HCl reaction with shells, no HCl reaction with cemented sand and soil, weak to moderate cementation 86.0 ft: Changes to gray and olive gray, estimated <5% shells, fine to medium sand size, moderate to highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil	SM	-18.7		85	S-34, SPT 8+11+35 REC=17", 94%		83.5 - 86.0 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
	88.0 - 102.5 ft: SILTY SAND, fine to medium grained sand, moist, olive gray, estimated <5% shells, fine to medium size fresh to highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil; contains a 1-inch layer of SILT WITH SAND (ML), olive, fine sand, moist, soft at 88.7 ft, 89 ft and 89.5 ft					S-35, SPT 20+26+21 REC=17", 94%		86.0 - 88.0 ft: light gray drilling fluid
	93.5 ft: Changes to fine grained sand, estimated 5 - 10% shells, weak HCl reaction with shells and soil, shell decrease with depth	SM			90	S-36, SPT 4+6+9 REC=18", 100%		88.5 - 93.5 ft: silty sand, fine to medium sand and fine to medium shell cuttings
	98.5 ft: Changes to estimated <5% shells, homogenous structure, fine to medium sand size, moderately to highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil				95	S-37, SPT 11+9+10 REC=18", 100%		93.5 - 98.5 ft: uniform drilling resistance, smooth drilling
					100	S-38, SPT 4+6+7 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
102.5	102.5 - 107.5 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated <5% shell fragments, firm, homogenous structure, fine sand size highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil	SM	-33.2				
		ML			105	S-39, SPT 7+10+11 REC=18", 100%	103.5 - 108.5 ft: uniform drilling resistance, smooth drilling
107.5	107.5 - 117.5 ft: SILTY SAND, fine grained sand, moist, olive gray, estimated <5% shells, homogenous structure, fine to medium sand size moderate to highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil		-38.2				
		SM			110	S-40, SPT 6+8+10 REC=18", 100%	108.5 - 113.5 ft: slight rig chatter from 111.0 to 111.5 ft (possible cemented sand), olive gray drilling fluid, clumps of silty sand, fine to medium sand and shells in cuttings
	113.5 ft: Changes to fine to medium grained sand, wet, estimated 5-10% shells, fine sand to angular coarse sand size fresh to highly weathered shells				115	S-41, SPT 6+8+14 REC=18", 100%	
117.5	117.5 - 137.0 ft: SILTY SAND, fine grained sand, moist, olive gray and greenish brown, estimated <5% shells, weak HCl reaction, homogenous structure, fine to medium sand size moderate to highly weathered shells		-48.2				
		SM			120	S-42, SPT 5+6+9 REC=18", 100%	118.5 - 123.5 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid, silty sand, fine to medium sand and shells in cuttings
	123.0 ft: Changes to olive gray and gray, fine sand size, highly weathered shells 123.5 ft: Changes to olive gray and grayish brown, fine to medium sand size moderate to highly weathered shells				125	S-43, SPT 7+9+11 REC=18", 100%	

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
					130	S-44, SPT 6+7+9 REC=11", 61%		128.5 - 133.5 ft: olive gray drilling fluid, marsh funnel test performed (41.0 sec drilling fluid)
		SM			135	S-45, SPT 6+9+10 REC=18", 100%		
137.0	133.5 ft: Changes to fine sand size highly weathered shells							
			-67.7					
	137.0 - 142.5 ft: SILTY SAND, fine grained sand, moist, olive gray, no HCl reaction, homogenous structure	SM			140	S-46, SPT 5+5+8 REC=18", 100%		
142.5								
	142.5 - 177.5 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated <5% shells, weak HCl reaction, hard, homogenous structure, fine sand size highly weathered shells		-73.2					
					145	S-47, SPT 7+9+11 REC=18", 100%		143.5 ft: driller de-sanded mud tub, driller flushed out boring with new drilling fluid; next day driller added ~ 50 gal of clean water to drilling fluid and cleaned out the hole
	148.5 ft: Changes to firm	ML			150	S-48, SPT 7+10+11 REC=18", 100%		148.5 - 153.5 ft: olive gray drilling fluid
						S-49, SPT 7+9+10 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
					155		
						S-50, SPT 7+9+12 REC=18", 100%	
					160		
						S-51, SPT 7+9+10 REC=18", 100%	
					165		
	163.5 ft: Changes to olive gray and grayish brown, lensed, 0.5 to 1.5 inch pockets of silty sand	ML				S-52, SPT 7+10+12 REC=18", 100%	163.5 - 168.5 ft: uniform drilling resistance, smooth drilling
					170		
						S-53, SPT 8+9+11 REC=18", 100%	
					175		
						S-54, SPT 4+10+13 REC=18", 100%	
177.5	177.5 - 179.3 ft: SILTY SAND, fine grained sand, moist, olive gray, estimated <5% shells, weak HCl reaction, fine to medium sand size moderate to highly weathered shells	SM	-108.2				
179.3	179.3 - 187.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, olive gray and light gray, estimated 15 - 25% shells, fine sand to angular fine sand size, fresh to highly weathered shells, weak HCl reaction	SP-SM	-110.0		180		173.5 - 178.5 ft: clumps of sandy silt and fine sand in cuttings
							178.5 - 179.3 ft: jar labeled as S-54A 178.5 ft: harder drilling 179.3 - 180.0 ft: jar labeled as S-54B

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	with shells, no HCl reaction with soil							
	183.5 ft: Changes to olive gray and gray, estimated <5% shells, homogenous structure, fine sand size highly weathered shells	SP-SM			185	S-55, SPT 7+10+14 REC=18", 100%		183.5 ft: driller rods clogged with sand, silt and shells, driller took off 35 ft of rods and flushed out the remaining rods
187.5	187.5 - 212.5 ft: SILTY SAND, fine grained sand, wet, olive gray, estimated <5% shells, weak HCl reaction, homogenous structure, fine sand size, highly weathered shells		-118.2		190	S-56, SPT 4+7+10 REC=18", 100%		188.5 - 193.5 ft: silty sand and fine sand cuttings
					195	S-57, SPT 5+7+11 REC=18", 100%		
		SM			200	S-58, SPT 6+8+10 REC=18", 100%		198.5 ft: driller desanded mud tub, added ~ 25 gals to drilling fluid and flushed hole with new drilling fluid
	203.0 ft: Changes to fine to medium sand size moderate to highly weathered shells				205	S-59, SPT 7+8+13 REC=18", 100%		

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-345**
Schnabel No.: 06120048
Sheet: 9 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	208.5 ft: Changes to fine sand size highly weathered shells	SM			210	S-60, SPT 7+9+12 REC=18", 100%		208.5 ft: marsh funnel test performed (41 sec drilling fluid)
212.5	212.5 - 250.0 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated <5% shells, weak HCl reaction, firm, homogenous structure, fine sand size highly weathered shells		-143.2		215	S-61, SPT 6+10+12 REC=18", 100%		
		ML			220	S-62, SPT 6+9+11 REC=18", 100%		
					225	S-63, SPT 6+9+11 REC=18", 100%		223.5 ft: driller emptied mud tub of all drilling fluid (too thick for pump), driller mixed 2 bags of bentonite with 150 gals of water (drilling fluid) 223.5 - 228.5 ft: light gray drilling fluid
					230	S-64, SPT 6+10+15 REC=18", 100%		228.5 - 233.5 ft: olive gray drilling fluid
					235	S-65, SPT 7+12+17 REC=18", 100%		233.5 - 238.5 ft: slightly harder drilling

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-345**
Schnabel No.: 06120048
Sheet: 10 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
								233.5 - 238.5 ft: slightly harder drilling (continued)
					240	S-66, SPT 7+13+19 REC=18", 100%		238.5 - 243.5 ft: uniform drilling resistance, smooth drilling
					245	S-67, SPT 8+10+14 REC=18", 100%		
						S-68, SPT 6+10+15 REC=18", 100%		
250.0			180.7		250			

Bottom of Boring at 250.0 ft.
Boring backfilled with cuttings upon completion.



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-346**
Schnabel No.: 06120048
Sheet: 1 of 5

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/1/08 Finished: 7/1/08

Easting: 960400.4 ft Northing: 217206.4 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 61.8 (ft) Total Depth: 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ∇	7/1	10:27 AM	13.5'	13.5'	---
Completion ∇	7/1	3:00 PM	8.6'	14.5'	81.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.5	0.0 - 0.5 ft: Rootmat and topsoil		61.3			S-1, SPT 1+2+2 REC=9", 50%		0.0 ft: Advanced 4-1/4" I.D. HSA to 14.5 ft. 0.0 to 2.5 ft interval uniform drilling resistance, smooth drilling, brown outtings, changes as noted below. See end of boring log for additional remarks.
	0.5 - 7.0 ft: POORLY GRADED SAND, medium to coarse grained sand, subangular particles, moist, brown, no HCl reaction							
	2.0 ft: Changes to brown and light brown, estimated <5% fine gravel, contains roots, subangular gravel					S-2, SPT 1+2+3 REC=11", 61%		
	5.0 ft: Changes to estimated <5% lean clay				5	S-3, SPT 2+2+2 REC=13", 72%		5.0 ft: Photograph for S-3 contains S-2 information
7.0	7.0 - 9.5 ft: POORLY GRADED SAND, medium to coarse grained sand, subangular particles, moist, light gray and orangish brown, estimated <5% fine gravel, no HCl reaction, angular gravel	SP	54.8			S-4, SPT 6+10+10 REC=11", 61%		7.5 - 10.0 ft: brownish orange cuttings
9.5	9.5 - 12.5 ft: SANDY LEAN CLAY, fine grained sand, moist, light gray with mottles of brownish orange, no HCl reaction, iron oxidation mottles	CL	52.3		10	S-5, SPT 1+2+3 REC=18", 100%		
12.5	12.5 - 17.0 ft: LEAN CLAY, moist, dark gray, contains mica, no HCl reaction	CL	49.3			S-6, SPT 2+4+4 REC=18", 100%		
					15			
17.0	17.0 - 24.0 ft: LEAN CLAY, moist, dark gray, contains mica, no HCl reaction, firm	CL	44.8			S-7, SPT 4+8+11 REC=18", 100%		14.5 ft: Switch to 3-1/2" O.D. tricone roller bit (mud rotary) and advanced to 100.0 ft, one bag of bentonite mixed with 125 gallons of water for mud mix 14.5 ft: Uniform drilling resistance, smooth drilling, gray drilling fluid.

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
24.0	24.0 - 27.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, no HCl reaction	CL	37.8		S-8, SPT 7+10+15 REC=18", 91%		23.5 - 24.0 ft: Jar labeled as S-8A 23.5 - 28.5 ft: Increasing drilling resistance with depth added mud thinner at 25.0 ft 24.0 - 25.0 ft: Jar labeled as S-8B
27.0	27.0 - 32.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated 5 - 10% shell fragments, coarse sand to fine gravel size fresh shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	34.8		S-9, SPT 19+50/5" REC=8", 74%		
32.0	32.0 - 39.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, light gray, estimated 5 - 10% shell fragments, coarse sand to medium gravel size fresh shell fragments, strong HCl reaction (with shells), strong HCl reaction, (with soil)	SP-SM	29.8		S-10, SPT 15+26+25 REC=14", 78%		33.5 - 38.5 ft: Uniform drilling resistance, smooth drilling
39.0	39.0 - 42.0 ft: LEAN CLAY, moist, dark gray, estimated <5% fine grained sand, estimated <5% shell fragments, contains mica, firm, fresh shell fragments, strong HCl reaction (with shells), strong HCl reaction (with soil)	CL	22.8		S-11, SPT 4+7+7 REC=18", 100%		38.5 - 39.0 ft: Jar labeled as S-11A 39.0 - 40.0 ft: Jar labeled as S-11B
42.0	42.0 - 48.0 ft: LEAN CLAY, moist, dark gray, estimated <5% fine grained sand, estimated <5% shell fragments, fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reactions (with soil)	CL	19.8		S-12, SPT 3+8+50 REC=18", 100%		46.0 - 48.0 ft: Bit chatter

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
48.0	48.0 - 52.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated <5% shell fragments, fine to medium gravel size fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	CL SP-SM	13.8		S-13, SPT 7+5+12 REC=18", 100%		46.0 - 48.0 ft: Bit chatter (continued) 48.5 - 53.5 ft: Uniform drilling reistance, smooth drilling, gray drilling fluid
52.0	52.0 - 57.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated 15 - 25% shell fragments, fine gravel size fresh shell fragments, strong HCl reaction (with shells) weak HCl reaction (with soil)	SP-SM	9.8		S-14, SPT 3+5+6 REC=4", 22%		
57.0	57.0 - 62.0 ft: POORLY GRADED SAND, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, contains 5 - 10% fine to medium gravel, coarse sand to medium gravel size highly weathered shell fragments, gravel is cemented sand, strong HCl reaction (with shells)	SP	4.8		S-15, SPT 27+15+12 REC=10", 56%		58.5 - 60.0 ft: Uniform drilling reistance, smooth drilling, gray drilling fluid
62.0	62.0 - 67.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, Coarse sand to fine gravel size highly weathered shell fragments, weak HCl reaction (with shells), no HCl reactoin. (with soil)	SP-SM	-0.2		S-16, SPT 5+6+10 REC=18", 100%		
67.0	67.0 - 72.0 ft: SILTY SAND, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, fine gravel size highly weathered shell fragments, strong HCl reaction, (with shells), weak HCl reaction (with soil)	SM	-5.2		S-17, SPT 5+6+8 REC=18", 100%		68.5 - 70.0 ft: Uniform drilling reistance, smooth drilling, gray drilling fluid
72.0	72.0 - 77.0 ft: SILTY SAND, fine to medium grained sand, wet, estimated 5 - 10% shell fragments, Coarse sand to fine gravel size moderatley to highly weathered shell fragments, strong HCl	SM	-10.2		S-18, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	reaction (with shells), weak HCl reaction (with soil)	SM			75	7+11+18 REC=18", 100%		
77.0	77.0 - 82.0 ft: CLAYEY SAND, fine to medium grained sand, wet, dark gray, estimated 15 - 25% shell fragments, fine to medium gravel size fresh shell fragments, contains a 2 inch layer of fine to coarse gravel, (as cemented sands) at 79.8 ft, strong HCl reaction (with shells), strong HCl reaction (with soil)	SC	-15.2		80	S-19, SPT 8+7+31 REC=18", 100%		78.5 - 83.5 ft: Uniform drilling resistance, smooth drilling, gray drilling fluid
82.0	82.0 - 87.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated <5% shell fragments, fine gravel size highly weathered shell fragments, weak HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-20.2		85	S-20, SPT 7+10+15 REC=18", 100%		
87.0	87.0 - 92.0 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, estimated <5% shell fragments, medium to coarse sand size highly weathered shell fragments, strong HCl reaction (with shells), strong HCl reaction (with soil)	CL	-25.2		90	S-21, SPT 10+17+10 REC=18", 100%		88.5 - 90.0 ft: Uniform drilling resistance, smooth drilling, gray drilling fluid
92.0	92.0 - 97.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, estimated <5% shell fragments, coarse sand to fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-30.2		95	S-22, SPT 5+8+11 REC=18", 100%		
97.0	97.0 - 100.0 ft: SILTY SAND, fine grained sand, moist, dark gray, weak HCl reaction	SM	-35.2					
100.0			-38.2		100	S-23, SPT 9+9+12 REC=18", 100%		

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-346**
Schnabel No.: 06120048
Sheet: 5 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		

Bottom of Boring at 100.0 ft.
Boring backfilled with bentonite and cement grouting using a tremie upon completion.

DRAFT



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-347
Schnabel No.: 06120048
Sheet: 1 of 11

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: M. Lark

Schnabel Representative: W. Bradfield

Equipment: CME-75 (ATV); AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger,
3 1/2" O.D. Tri-Cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/16/08 **Finished:** 7/23/08

Easting: 960531.8 **Northing:** 217214.2 **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 60.2 (ft) **Total Depth:** 200.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/16	---	11.0'	10.0'	---
Start of Day	7/17	7:20 AM	-0.7'	13.5'	13.9'
Start of Day	7/18	7:11 AM	7.8'	13.5'	---
Start of Day	7/21	8:35 AM	12.2'	13.5'	75.0'
Start of Day	7/22	7:04 AM	8.5'	13.5'	---
Start of Day	7/23	7:10 AM	7.0'	13.5'	---
Completion	7/23	10:40 AM	7.4'	13.5'	---

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.3	0.0 - 0.3 ft: Topsoil, roots		59.9			S-1, SPT 1+1+1 REC=14", 78%		0.0 - 2.5 ft: Advanced 6 1/4 inch I.D. HSA to 12.5 ft; 0.0 to 2.5 ft interval uniform drilling resistance, smooth drilling; changes as noted below; see end of boring log for additional remarks.
2.0	0.3 - 2.0 ft: SILTY SAND, fine to medium grained sand, moist, dark brown, estimated 15 - 25% roots, no HCl reaction 1.0 ft: Changes to light yellowish brown, estimated 5 - 10% roots	SM	58.2			S-2, SPT 2+2+5 REC=7", 39%		
4.5	2.0 - 4.5 ft: SANDY LEAN CLAY, fine to medium grained sand, moist, light yellowish brown with mottles of light gray, estimated <5% roots, no HCl reaction	CL	55.7		5	S-3, SPT 3+4+6 REC=13", 72%		
8.1	4.5 - 8.1 ft: SANDY LEAN CLAY, fine to medium grained sand, moist, light gray with bands of brownish orange, no HCl reaction, <1/4 inch layer of fine sand, layers are brownish orange. Contains 1 inch layer of lean clay with sand at 7.9 ft, moist, dark gray, no HCl, firm	CL	52.1			S-4, SPT 2+3+6 REC=14.5", 81%		
8.8	8.1 - 8.8 ft: SILTY SAND, fine to medium grained sand, moist, brownish olive with mottles of light gray	SM	51.4					7.5 - 8.1 ft: jar labeled as S-4A 8.1 - 8.8 ft: jar labeled as S-4B
9.5	8.8 - 9.5 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, no HCl reaction, firm	CL	50.7					
12.0	9.5 - 12.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, dark gray, estimated 5 - 10% silt, contains mica, no HCl reaction, 2 layers of sandy lean clay, dark gray from 10.0 - 10.1 ft and 3/4 inch thick layer at 11.4 ft	SP-SM	48.2		10	S-5, SPT 2+7+7 REC=16", 89%		12.5 ft: switched to 3 1/2 inch O.D. tricone roller bit (mud rotary) and advanced to 200 ft; mix 25 lbs bentonite with 100 gal water
14.5	12.0 - 14.5 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, contains mica, no HCl reaction, hard	CL	45.7			S-6, SPT 3+4+8 REC=18", 100%		
	14.5 - 17.0 ft: LEAN CLAY WITH	CL						

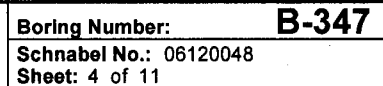
(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
17.0	SAND, moist, dark gray, contains mica, no HCl reaction, hard	CL	43.2		S-7, SPT 4+7+9 REC=18", 100%		12.5 - 15.0 ft: uniform drilling resistance, smooth drilling, light brownish gray drilling fluid
17.0 - 20.3 ft	CLAYEY SAND, fine to medium grained sand, moist, dark gray, contains mica, no HCl reaction, homogenous structure	SC			S-8, SPT 3+3+4 REC=18", 100%		15.0 - 17.5 ft: Light gray drilling fluid
20.3	20.3 - 21.1 ft: SANDY LEAN CLAY, fine to medium grained sand, moist, dark gray, contains mica, no HCl reaction, hard	CL	39.9		S-9, SPT 3+7+11 REC=18", 100%		20.0 - 20.3 ft: jar labeled as S-9A
21.1	21.1 - 23.2 ft: CLAYEY SAND, fine to coarse grained sand, subrounded to subangular particles, moist, dark gray, estimated <5% cemented sands, no HCl reaction (with soil), no HCl reaction (with cemented sands)	SC	39.1		S-10, SPT 9+16+50/5" REC=17", 94%		20.3 - 21.1 ft: jar labeled as S-9B 21.1 - 21.5 ft: jar labeled as S-9C
23.2	22.5 ft: Changes to coarse grained sand		37.0				22.5 - 23.2 ft: jar labeled as S-10A
23.2 - 27.0 ft	SILTY SAND, fine to coarse grained sand, subangular particles, moist, dark gray, estimated 15 - 25% cemented sands, estimated <5% shell fragments, moderate cementation, subangular fine gravel, highly weathered shell fragments, weak HCl reaction (with shells and cemented sands), no HCl reaction (with soil)	SM			S-11, SPT 36+47+42 REC=17", 94%		23.2 - 24.0 ft: jar labeled as S-10B 23.5 ft: increased drilling resistance, harder drilling (possible cemented sand) added 25 lbs bentonite
27.0	25.0 ft: Changes to coarse grained sand, angular particles, dark gray with light brownish white, estimated 15 - 25% shell fragments, estimated <5% cemented sands, strong cementation, coarse sand size moderately weathered to fresh shell fragments, no HCl reaction (with soil), strong HCl reaction (with shells), weak HCl reaction (with cemented sands)	SP-SM	33.2		S-12, SPT 40+50/4.5" REC=9.5", 53%		25.0 - 30.0 ft: Hard drilling
27.0 - 32.0 ft	POORLY GRADED SAND WITH SILT, fine and coarse grained sand, wet, dark gray with speckles of white, estimated 5 - 10% shell fragments, angular coarse sand, coarse sand sized highly to moderately weathered shell fragments, no HCl reaction (with shells), strong HCl reaction (with soil)				S-13, SPT 50+50/4" REC=9.5", 53%		30.0 ft: Added 25 lbs bentonite
32.0	30.0 ft: Changes to fine to medium grained sand, gray, estimated <5% shell fragments, medium sand sized moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	28.2		S-14, SPT 14+29+29 REC=11.5", 64%		32.5 - 35.0 ft: Hard drilling
32.0 - 39.5 ft	SILTY SAND, fine and coarse grained sand, angular particles, wet, gray, estimated 50 - 100% shell fragments, angular fine gravel,						

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
39.5	brownish white and black shells, medium to coarse sand and fine gravel size moderately weathered to fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil) 35.0 ft: Changes to estimated 50 - 100% shell fragments, coarse sand sized 38.2 ft: Changes to moist, dark gray with light brownish white, estimated 15 - 25% shell fragments, medium to coarse sand and fine gravel sizes shell fragments, highly to moderately weathered shell fragments, weak to strong HCl reaction (with shells), no HCl reaction (with soil) 39.5 - 42.0 ft: SANDY SILT, fine grained sand, moist, dark greenish gray, contains mica, weak HCl reaction, homogenous structure	SM	20.7			S-15, SPT 13+14+15 REC=11.5", 64%		
						S-16, SPT 7+4+4 REC=17", 94%		37.5 - 38.2 ft: jar labeled as S-16A 38.2 - 39.0 ft: jar labeled as S-16B
					40	S-17, SPT 3+2+4 REC=18", 100%		39.0 ft: easier drilling with uniform drilling resistance 40.0 - 42.5 ft: Smooth drilling, sand
42.0	42.0 - 48.4 ft: SILTY SAND, fine to coarse grained sand, subangular to angular particles, moist, greenish gray, estimated 50 - 100% cemented sands, moderate cementation, no HCl reaction (with soil), no HCl reaction (with cemented sand), coarse sand and cemented sands fracture	SM	18.2			S-18, SPT 50/1.5" REC=1.5", 8%		42.5 - 45.0 ft: Very hard drilling with grinding/scraping slow penetration rate
					45	S-19, SPT 50/4" REC=0", 0%		42.5 ft: harder drilling with rig chatter
						S-20, SPT 12+6+44 REC=18", 100%		45.0 - 47.5 ft: Very hard drilling with rig chatter, slow penetration rate; at 46 ft, easier drilling, no chatter, slower penetration rate
48.4	47.5 ft: Changes to light brownish gray, estimated 15 - 25% shell fragments, angular fine gravel, with light brown and black coarse sand to fine gravel sized fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil) 48.1 ft: Changes to wet	SM	11.8					47.5 - 50.0 ft: Intermittent (6") zones of hard drilling with rig chatter and easier drilling with little resistance, gray drilling fluid
	48.4 - 50.8 ft: CLAYEY SAND, fine to coarse grained sand, angular to subrounded particles, moist, light gray and dark gray, estimated 30 - 45% shell fragments, organic odor, strong cementation, dark gray cemented sands, medium to coarse and fine gravel sized highly weathered to fresh shell fragments, strong HCl reaction (with soil), strong HCl reaction (with cemented sands), coarse sand and fine gravel sized cemented sands fracture	SM			50	S-21, SPT 4+3+4 REC=18", 100%		50.0 - 52.5 ft: Uniform drilling resistance, smooth drilling, gray drilling fluid
50.8	50.0 ft: Changes to angular particles, wet, gray with light brownish white, angular fine gravel, strong HCl reaction (with shells), no HCl reaction (with soil)	SM	9.4			S-22, SPT 3+4+4 REC=18", 100%		50.0 - 50.8 ft: jar labeled as S-12A
	50.8 - 62.0 ft: SILTY SAND, fine to coarse grained sand, angular particles,				55	S-23, SPT		50.8 - 51.5 ft: jar labeled as S-12B

(continued)



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TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04 22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	sand sized shell fragments, strong HCl reaction (with shells and cemented sands) 75.0 ft: Changes to angular particles, light gray, angular fine gravel					REC=17.5", 97%		75.5 ft: drilling became easier, uniform drilling resistance, smooth drilling
	75.4 - 81.2 ft: SILTY SAND, fine to coarse grained sand, angular particles, wet, light gray with speckles of grayish white, medium to coarse sand and fine gravel sized highly weathered to fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SM				S-32, SPT 15+11+17 REC=17", 94%		75.0 - 77.5 ft: Hard drilling with slight rig chatter (continued)
	77.5 ft: Changes to angular to subrounded particles, wet, gray with streaks of white, estimated 15 - 25% shell fragments, estimated 5 - 10% cemented sands, coarse sand and fine gravel as cemented sands, strong HCl reaction (with cemented sands)				80	S-33, SPT 6+8+11 REC=16", 89%		75.4 - 76.5 ft: jar labeled as S-31B (continued)
81.2	81.2 - 84.5 ft: POORLY GRADED WITH SILT, fine to coarse grained sand, angular to subangular particles, wet, dark gray with speckles of white, estimated 5 - 10% shell fragments, medium to coarse sand sized highly to moderately weathered shell fragments, weak to strong HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-21.0					80.0 - 81.2 ft: jar labeled as S-33A
84.5	84.5 - 86.1 ft: SILTY SAND, fine to coarse grained sand, angular to subangular particles, moist, gray with streaks of brownish white, estimated 15 - 25% shell fragments, medium to coarse sand sized highly to moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-24.3		85	S-34, SPT 5+9+50/5.5" REC=17", 94%		81.2 - 81.5 ft: jar labeled as S-33B
86.1		SM	-25.9					85.0 - 90.0 ft: Harder drilling, rig chatter
87.0	86.1 - 87.0 ft: SILTY SAND WITH GRAVEL, fine to coarse grained sand, angular to subrounded particles, moist, gray with streaks of light brownish white, estimated 30 - 45% shell fragments, estimated 15 - 25% cemented sands, weak cementation, medium to coarse sand and fine gravel sized moderately weathered shell fragments, coarse sand and fine gravel sized cemented sands, strong HCl reaction (with shells and cemented sand), weak HCl reaction (with soil)	SM	-26.8		90	S-35, SPT 5+7+8 REC=18", 100%		85.0 - 86.1 ft: jar labeled as S-34A
	87.0 - 94.0 ft: SILTY SAND, fine grained sand, moist, gray with streaks of white, estimated <5% shell fragments, contains mica, highly weathered shell fragments weak HCl reaction (with shells), no HCl reaction (with soil), contains small (1/8 inch to 1/4 inch) pockets of silt throughout sample							86.1 - 86.5 ft: jar labeled as S-34B
94.0	94.0 - 98.5 ft: SANDY SILT, fine grained sand, moist, dark greenish gray with speckles of light brownish white, estimated <5% shell fragments, contains mica, hard, highly weathered shell fragments, strong HCl reaction	ML	-33.8		95	S-36, SPT 7+10+11 REC=18", 100%		87.0 ft: Drilling became easier

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	(with shells), weak HCl reaction (with soil)	ML					gal water
98.5	98.5 - 114.0 ft: SILTY SAND, fine to coarse grained sand, angular particles, moist, dark greenish gray with streaks of light brownish white, estimated 5 - 10% shell fragments, contains mica, medium to coarse sand sized highly weathered to fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)		-38.3		100 S-37, SPT 4+7+9 REC=18", 100%		
	105.0 ft: Changes to subangular to angular particles, estimated 30 - 45% shell fragments	SM			105 S-38, SPT 5+7+11 REC=12", 67%		103.3 ft: Drilling became harder with rig chatter (possible shell fragments) 104.0 ft: Drilling became easier, uniform drilling resistance
	109.0 ft: Changes to highly to moderately weathered shell fragments				110 S-39, SPT 4+7+8 REC=18", 100%		110.0 - 115.0 ft: Light gray drilling fluid cuttings are silty sand
114.0	114.0 - 119.0 ft: SANDY SILT, fine grained sand, moist, dark greenish gray with speckles of light brownish white, estimated 5 - 10% shell fragments, hard, medium to coarse sand sized highly to moderately weathered shell fragments, strong HCl	ML	-53.8		115 S-40, SPT 6+8+12 REC=18", 100%		115.0 - 120.0 ft: gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	reaction (with shells), weak HCl reaction (with soil)	ML						115.0 - 120.0 ft: gray drilling fluid (continued)
119.0	119.0 - 124.0 ft: SILTY SAND, fine grained sand, moist, olive gray with speckles of light brownish white, estimated <5% shell fragments, contains mica, highly weathered shell fragments, strong HCl reaction (with shells), strong HCl reaction (with soil)	SM	-58.8		120	S-41, SPT 5+8+8 REC=18", 100%		120.0 - 125.0 ft: Clumps of firm gravel and silty sand/silty sand with fine to coarse sized shell fragments in cuttings
124.0	124.0 - 129.0 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated <5% shell fragments, contains mica, firm, homogenous structure, medium sand sized highly weathered shell fragments, weak HCl reaction (with shells), weak HCl reaction (with soil)	ML	-63.8		125	S-42, SPT 4+5+8 REC=18", 100%		
129.0	129.0 - 134.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, homogenous structure	SM	-68.8		130	S-43, SPT 5+6+8 REC=18", 100%		
134.0	134.0 - 139.0 ft: SANDY SILT, fine grained sand, moist, olive gray with speckles of white, estimated <5% shell fragments, contains mica, firm, homogenous structure, highly to moderately weathered shell fragments, strong HCl reaction (with shells and soil)	ML	-73.8		135	S-44, SPT 5+6+10 REC=18", 100%		135.0 - 140.0 ft: Olive gray drilling fluid, sandy silt cuttings

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-347**
Schnabel No.: 06120048
Sheet: 8 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
139.0	139.0 - 169.0 ft: SANDY SILT, fine grained sand, moist, olive gray, firm, homogenous structure, contains manganese weak HCl reaction	ML	-78.8		140	S-45, SPT 6+8+12 REC=18", 100%		135.0 - 140.0 ft: Olive gray drilling fluid, sandy silt cuttings (continued)
					145	S-46, SPT 5+8+10 REC=18", 100%		140.0 - 145.0 ft: Light olive gray drilling fluid
					150	S-47, SPT 6+7+10 REC=18", 100%		141.5 ft: Drilling mud consistently thinning out during drilling, pumped out all drilling fluid in mud tub and mixed a new batch of drilling mud (63 lbs. powered bentonite to 100 gal water)
	149.0 ft: Changes to olive gray, weak HCl reaction, firm	ML			155	S-48, SPT 6+9+11 REC=18", 100%		150.0 - 155.0 ft: silty sand and contain medium sand sized shell fragments in cuttings

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
								155.0 - 160.0 ft: clumps of fine sandy silt/silty sand and some medium to coarse sized shell fragments in cuttings (continued)
					160	S-49, SPT 6+7+11 REC=18", 100%		160.0 - 165.0 ft: silty sand and some clumps of fine sand silt/bentonite and medium sized shell fragments in cuttings
					165	S-50, SPT 5+7+11 REC=18", 100%		165.0 - 170.0 ft: Some clumps of bentonite, silty sand and coated fine sandy silt/silty sand and medium to coarse sand sized shell fragments in cuttings
169.0	169.0 - 179.0 ft: SILTY SAND, fine to medium grained sand, moist, olive gray with streaks of light brownish white, estimated 5 - 10% shell fragments, contains mica, medium to coarse sized highly weathered to fresh shell fragments, strong HCl reacion (with shells), weak HCl reaction (with soil) 170.8 ft: Changes to estimated 15 - 25% shell fragments, medium to fine gravel sized shell fragments, strong HCl reaction (with shells)	SM	-108.8		170	S-51, SPT 2+3+8 REC=18", 100%		170.0 - 175.0 ft: Easy drilling, softer drilling resistance
	175.0 ft: Changes to wet, dark olive gray with speckles of light brown, estimated 5 - 10% shell fragments, moderately weathered to fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)				175	S-52, SPT 4+6+10 REC=7.5", 42%		171.7 ft: Drilling becomes harder with uniform drilling resistance, light olive gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
179.0	179.0 - 197.5 ft: SILTY SAND, fine to medium grained sand, moist, grayish green, contains mica, no HCl reaction, homogenous structure	SM	-118.8		180	S-53, SPT 3+4+9 REC=18", 100%		175.0 - 180.0 ft: Uniform drilling resistance, smooth drilling, light olive gray drilling fluid, fine to medium sandy silt/silty sand clumps and medium to coarse sand sized shell fragments in cuttings (continued)
	185.0 ft: Changes to fine grained sand, weak HCl reaction	SM			185	S-54, SPT 4+7+12 REC=18", 100%		185.0 - 190.0 ft: fine to medium sand, clumps of fine sandy silt/silty sand and fine medium to coarse sand sized shell fragments in cuttings
					190	S-55, SPT 4+5+9 REC=16", 89%		
					195	S-56, SPT 5+6+10 REC=18", 100%		


(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-347**
Schnabel No.: 06120048
Sheet: 11 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
197.5	197.5 - 200.0 ft: SILTY SAND, fine grained sand, moist, grayish green with streaks of white, estimated <5% shell fragments, highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-137.3			S-57, SPT 4+7+9 REC=18", 100%		195.0 - 198.5 ft: fine to medium sand with some clumps of fine sandy silt/silty sand and trace amount of medium to coarse sand size shell fragments in cuttings (continued)
200.0		SM						

Bottom of Boring at 200.0 ft.

NOTE: Negative groundwater depth denotes water level above ground surface (i.e. "negative depth"), and does not necessarily imply artesian conditions.

DRAFT

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-348**
Schnabel No.: 06120048
Sheet: 1 of 11

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: M. Lark

Schnabel Representative: W. Bradfield

Equipment: CME-75 (ATV); AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/9/08 **Finished:** 7/16/08

Easting: 960568 ft **Northing:** 217149 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 68± (ft) **Total Depth:** 200.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/9	---	17.5'	14.5'	---
Start of Day	7/10	7:10 AM	0.0'	14.5'	---
Start of Day	7/11	7:27 AM	-3.9'	14.5'	---
Start of Day	7/14	10:09 AM	15.7'	14.5'	100.0'
Start of Day	7/15	7:18 AM	18.6'	14.5'	---
Completion	7/15	1:03 PM	11.4'	14.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.5	0.0 - 0.5 ft: Topsoil, forest litter, roots		67.4			S-1, SPT 2+1+1 REC=16", 89%		
3.5	0.5 - 3.5 ft: CLAYEY SAND, fine to medium grained sand, moist, yellowish red, estimated 5 - 10% roots, no HCl reaction	SC				S-2, SPT 1+2+4 REC=14", 78%		
7.0	3.5 - 7.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, yellowish red, no HCl reaction, lensed, contains 1/2" pockets of SILT (ML), moist, yellowish brown	SP-SM	64.4		5	S-3, SPT 2+7+8 REC=13", 72%		1.5 - 2.5 ft: advanced 6 1/4" OD HSA to 14.5 ft, uniform resistance, smooth drilling, changes as noted below. See end of boring log for additional remarks.
9.5	4.5 ft: Changes to light red, no HCl reaction, contains 3" layer of silty sand, moist, yellowish brown at 5 ft							2.5 - 3.5 ft: jar labeled as S-2A
10.3	7.0 - 9.5 ft: SILTY SAND, fine to medium grained sand, moist, dark yellowish brown with bands of yellowish brown, no HCl reaction, stratified, 1/8" to 1/4" alternating layers of yellowish brown and light gray	SM	60.9			S-4, SPT 2+3+4 REC=13", 72%		3.5 - 4.0 ft: jar labeled as S-2B
10.3	9.5 - 10.3 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, light red, no HCl reaction	SP-SM	58.4		10	S-5, SPT 5+5+6		6.0 ft: light red cuttings
12.9	10.3 - 12.9 ft: SANDY LEAN CLAY, fine to medium grained sand, moist, light gray and dark yellowish brown, no HCl reaction, soft, stratified, 1/8 to 1 inch alternating colors with bands of yellowish brown, light gray layers are lean clay, dark yellowish brown layers are more sandy	CL	57.6					10.0 - 10.3 ft: jar labeled as S-5A
14.5	12.0 ft: Changes to fine grained sand, gray with mottles of dark yellowish brown, soft, and light gray	MH	55.0			S-6, SPT 2+2+4 REC=18", 100%		10.3 - 11.5 ft: jar labeled as S-5B
14.5	12.9 - 14.5 ft: SANDY ELASTIC SILT, fine grained sand, moist, gray, contains mica, no HCl reaction, soft		53.4			S-7, SPT 2+3+5		12.5 - 12.9 ft: jar labeled as S-6A
	14.5 - 17.0 ft: LEAN CLAY WITH	CL						12.9 - 14.0 ft: jar labeled as S-6B

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	SAND, fine grained sand, moist, gray, contains mica, no HCl reaction, firm, contains ~ 1/2" layer of poorly graded sand with clay, fine sand, moist, gray at 15.5 ft and 15.9 ft	CL				REC=18", 100%		red cuttings
17.0	17.0 - 18.0 ft: SANDY LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction, soft	CL	50.9					14.5 ft: switched to 3 1/2" OD tricone roller bit
18.0	18.0 - 18.4 ft: POORLY GRADED SAND WITH CLAY, fine to medium grained sand, wet, dark gray, contains mica, no HCl reaction	SP-SC	49.9			S-8, SPT 3+4+8 REC=18", 100%		caved rotary and advanced to 200.0 ft, uniform resistance, brownish gray drilling fluid
18.4	18.4 - 19.5 ft: SANDY LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction, firm	CL	49.5					14.5 - 16.0 ft: SPT Hammer Energy Test performed (continued)
19.5	19.5 - 22.0 ft: LEAN CLAY WITH SAND, fine grained sand, moist, dark gray, contains mica, no HCl reaction, hard	CL	48.4		20	S-9, SPT 3+5+6 REC=18", 100%		17.5 - 18.0 ft: jar labeled as S-8A
22.0	22.0 - 24.5 ft: LEAN CLAY, moist, gray, estimated 5 - 10% fine grained sand, no HCl reaction, hard	CL	45.9			S-10, SPT 4+6+9 REC=18", 100%		17.5 ft: light gray drilling fluid
24.5	24.5 - 29.5 ft: CLAYEY SAND, fine to medium grained sand, moist, gray, contains mica, no HCl reaction	SC	43.4		25	S-11, SPT 3+3+4 REC=15.5", 86%		18.0 - 18.4 ft: jar labeled as S-8B
27.0	Changes to fine to coarse grained sand, subrounded to subangular particles, weak cementation, coarse sand crumble	SC				S-12, SPT 4+7+10 REC=18", 100%		18.4 - 19.0 ft: jar labeled as S-8C
29.5	29.5 - 32.0 ft: SILTY SAND, fine to coarse grained sand, angular particles, moist, gray, estimated 5 - 10% cemented sands, cemented sands are fine to coarse gravel sized, angular, weak to strong cementation, coarse sand sized cemented sands crumble, fine to coarse gravel sized cemented sands fracture	SM	38.4		30	S-13, SPT 10+19+43 REC=18", 100%		30.0 - 31.0 ft: SPT Hammer Energy Test performed
32.0	32.0 - 34.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, no HCl reaction, contains silty sand, fine to coarse sand, subrounded to angular coarse sand, wet, gray with brownish white, est 5 to 10% shell fragments, coarse sized shells moderately weathered shell fragments, est 5 to 10% cemented sands, cemented sands are coarse sand to fine gravel size, weak	SP-SM	35.9			S-14, SPT 19+23+30 REC=16", 89%		30.5 - 32.5 ft: increased resistance, light gray; thickened mud (add 25 lbs powdered bentonite)
34.5		SM	33.4		35			32.5 - 35.0 ft: moderately stiff resistance, minor grinding, gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	to strong cementation, coarse sand sized cemented sands crumble, fine gravel sized cemented sands fracture.	SM				S-15, SPT 13+21+39 REC=18", 100%		35.0 ft: uniform resistance, smooth drilling
37.0	34.5 - 37.0 ft: SILTY SAND, fine to coarse grained sand, wet, gray with brownish white, estimated 15 - 25% shell fragments, coarse sand size moderate to highly weathered shell fragments; contains less than 1 inch layer of silt, moist, gray; weak to strong HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	30.9			S-16, SPT 34+44+44 REC=16", 89%		
39.5	37.0 - 39.5 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, wet, gray with brownish white, estimated 15 - 25% shell fragments, lensed, coarse sand size fresh to highly weathered shell fragments; contains less than 1/4 inch layer of silt, moist gray; weak to strong HCl reaction (with shells), no HCl reaction (with soil)	SM	28.4		40	S-17, SPT 18+24+39 REC=13", 72%		
42.0	39.5 - 42.0 ft: SILTY SAND, fine to medium grained sand, wet, gray with brownish white, estimated 15 - 25% shell fragments, lensed, moderate to highly weathered shell fragments; contains 1/4 to 3/4 inch of silt, moist gray; weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	25.9			S-18, SPT 32+34+24 REC=15", 83%		
45.0	42.0 - 45.0 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, wet, gray with brownish white, estimated 30 - 45% shell fragments, fresh to highly weathered coarse sand to fine gravel sized shell fragments; weak HCl reaction (with shells), no HCl reaction (with soil), strong HCl reaction with mechanically broken fresh shells.	SM	22.9		45	S-19, SPT 13+5+6 REC=18", 100%		44.0 - 45.0 ft: slight rig chatter
45.7	45.0 - 45.7 ft: SILTY SAND, fine to coarse grained sand, wet, light gray with brownish white, estimated 50 - 100% shell fragments, coarse sand to fine gravel sized fresh and moderately weathered shell fragments; weak HCl reaction (with shells), no HCl reaction (with soil), strong HCl reaction with mechanically broken fresh shells	MH	22.2			S-20, SPT 2+3+4 REC=18", 100%		45.0 - 46.5 ft: SPT Hammer Energy Test performed 45.0 ft: gray drilling fluid with sand and shells in cuttings 45.0 - 45.7 ft: jar labeled as S-19A 45.7 - 46.5 ft: jar labeled as S-19B
49.5	45.7 - 49.5 ft: SANDY ELASTIC SILT, fine to coarse grained sand, moist, gray with brownish white, estimated 5 - 10% shell fragments, firm, coarse sand size, moderately weathered to fresh, shell fragments; strong HCl reaction (with shells), no HCl reaction (with soil),	SM	18.4		50	S-21, SPT 50/5.5" REC=5.5", 46%		50.0 ft: harder drilling, minor grinding/scraping
52.0	47.5 ft: Changes to fine grained sand, estimated <5% shell fragments, medium sand sized moderately weathered shell fragments, no HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	15.9			S-22, SPT 50/5" REC=4", 22%		52.5 ft: hard drilling, slight grinding, trace cuttings
54.5	49.5 - 52.0 ft: SILTY SAND, fine to medium grained sand, moist, dark gray, estimated 30 - 45% cemented sands, no HCl reaction, coarse sand to coarse gravel sized; cemented sands moderate to strong cementation	SM	13.4		55	S-23, SPT		55.0 ft: no

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
57.0	52.0 - 54.5 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, moist, gray, estimated 30 - 45% cemented sands, estimated 5 - 10% shell fragments, moderately weathered shell fragments; coarse sand to coarse gravel sized cemented sands; no HCl reaction (with shells), no HCl reaction (with cemented sands), no HCl reaction (with soil), fragments; weak to strong cementation	SM	10.9		22+5+12	REC=18", 100%		cuttings
	54.5 - 57.0 ft: SILTY SAND, fine to coarse grained sand, wet, gray and light gray, with brownish white, est 15 - 25% cemented sands, est 5 - 10% shell fragments coarse sand to fine gravel sized, fresh to moderately weathered shell fragments; coarse sand to fine gravel size cemented sand, strong HCl reaction (with shells), no HCl reaction (with soil),	SP-SM			S-24, SPT	5+6+7		57.5 ft: easier drilling, uniform resistance
62.0	57.0 - 62.0 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, wet, gray with white, estimated 30 - 45% shell fragments, coarse sand to fine gravel size fresh to highly weathered shell fragments; strong HCl reaction (with shells), no HCl reaction (with soil),	SM	5.9		S-25, SPT	4+5+9 REC=16.5", 92%		60.0 - 61.5 ft: SPT Hammer Energy Test performed
64.5	62.0 - 64.5 ft: SILTY SAND, fine to coarse grained sand, wet, gray with streaks of grayish white, estimated 15 - 25% shell fragments, estimated 5 - 10% cemented sands, coarse sand size; highly weathered to fresh shell fragments; coarse sand to fine gravel sized cemented sands; strong HCl reaction (with shells), weak HCl reaction (with cemented sands), no HCl reaction (with soil), weak to moderate cementation	SM	3.4		S-26, SPT	6+14+11 REC=17", 94%		62.5 - 65.0 ft: drilling and resistance alternated from hard to soft during run
	64.5 - 77.0 ft: SILTY SAND, fine to medium grained sand, wet, gray with speckles of brownish white, estimated 5 - 10% shell fragments, coarse sand size moderate to highly weathered shell fragment; strong HCl reaction (with shells), no HCl reaction (with soil)				S-27, SPT	4+4+5		65.0 ft: uniform resistance, smooth drilling
	67.0 ft: Changes to gray, estimated <5% shell fragments, moderately weathered shell fragments, weak HCl reaction (with shells)	SM			S-28, SPT	4+5+8 REC=18", 100%		
	70.0 ft: Changes to no shell fragments				S-29, SPT	4+4+7 REC=18", 100%		
	72.5 ft: Changes to estimated <5% shell fragments, no HCl reaction, highly weathered shell fragments				S-30, SPT	3+3+5 REC=18", 100%		72.5 - 75.0 ft: fine to medium sand cuttings, some coarse sand sized shell fragments in cuttings
	74.5 ft: Changes to gray with speckles of brownish white, estimated <5% shell fragments, moderate to highly weathered shell fragments				S-31, SPT	3+2+6		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
77.0	77.0 - 80.9 ft: CLAYEY SAND, fine to coarse grained sand, moist, gray with brownish white, estimated 5 - 10% shell fragments, coarse sand size highly weathered to fresh shell fragments; strong HCl reaction (with shells), no HCl reaction (with soil),	SM	-9.1			REC=18", 100%		75.0 - 76.5 ft: SPT Hammer Energy Test performed (continued)
80.9	79.5 ft: Changes to pinkish gray and light gray, with brownish white, est 30 - 45% shell fragments, est 5 - 10% cemented sands, coarse sand to fine gravel sized highly weathered to fresh shell fragments; cemented sands as coarse sand to coarse gravel fragments; strong HCl reaction (with shells), strong HCl (with cemented sands), no HCl reaction (with soil), moderate to strong cementation	SC	-13.0		80	S-31, SPT 4+5+12 REC=14", 78%		79.5 ft: slightly harder drilling 80.0 ft: some grinding 80.0 - 82.5 ft: stiffer resistance, slight rig chatter, light gray drilling fluid
87.0	80.9 - 87.0 ft: SILTY SAND, fine to coarse grained sand, moist, pinkish gray and brownish white, estimated 50 - 100% shell fragments, estimated 30 - 45% cemented sands, coarse sand to coarse gravel size highly weathered to fresh shell fragments, cemented sands and coarse sand to fine gravel, strong HCl reaction (with shells), strong HCl reaction (with cemented sands), no HCl reaction (with soil), moderate to strong cementation	SM	-19.1		85	S-33, SPT 19+17+33 REC=18", 100%		80.0 - 80.6 ft: jar labeled as S-33A 80.9 - 81.5 ft: jar labeled as S-33B
89.5	82.1 ft: Changes to estimated 15 - 25% cemented sands, weak to strong HCl reaction (with cemented sands), weak to moderate cementation; 82.5 ft: Changes to estimated 30 - 45% cemented sands, estimated 30 - 45% shell fragments, weak to strong HCl reaction (with cemented sands) 85.0 ft: Changes to wet, gray and light gray, est 5 - 10% cemented sand, est 15 - 25% shell fragments, fine gravel sized cemented sands; strong HCl reaction (with cemented sands),	SM	-21.6		90	S-34, SPT 31+14+9 REC=14", 78%		82.5 - 85.0 ft: alternating hard and easier drilling, slight grinding, gray drilling fluid 85.0 ft: uniform resistance, smooth drilling
	87.0 - 89.5 ft: SILTY SAND, fine to medium grained sand, wet, gray, estimated <5% shell fragments, no HCl reaction, highly weathered shell fragments	SM			95	S-35, SPT 19+16+21 REC=14", 78%		90.0 - 91.5 ft: SPT Hammer Energy Test performed
	89.5 - 98.0 ft: moist, gray with streaks of brownish white, estimated 15 - 25% shell fragments, coarse sand to fine gravel sized highly weathered to fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SM				S-36, SPT 9+12+15 REC=4", 22%		93.0 ft: slightly harder drilling with rig chatter 93.5 ft: uniform resistance, smooth drilling
	93.0 ft: Changes to wet, gray, estimated <5% shell fragments, highly to moderately weathered shell fragments	SM				S-37, SPT 6+10+13 REC=18", 100%		
						S-38, SPT 4+4+9 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
98.0	98.0 - 108.0 ft: SANDY SILT, fine to medium grained sand, moist, gray, contains mica, moderate to highly weathered shell fragments; no HCl reaction (with shells), strong HCl reaction (with soil) with interbeds of silty sand, fine to medium sand, moist, gray; estimated < 5% shell fragments	SM	-30.1				
					100	S-39, SPT 6+9+14 REC=18", 100%	100.0 ft: gray drilling fluid
		ML					
	105.0 ft: Changes to no HCl reaction, firm				105	S-40, SPT 5+4+8 REC=18", 100%	105.0 - 106.5 ft: SPT Hammer Energy Test performed
108.0	108.0 - 113.0 ft: SANDY SILT WITH GRAVEL, fine to coarse grained sand, wet, gray and white, estimated 50 - 100% shell fragments, estimated 15 - 25% cemented sands, subangular coarse gravel, coarse sand to coarse gravel size moderately weathered to fresh shell fragments; coarse gravel size cemented sands, strong HCl reaction (with shells), strong HCl reaction (with cemented sands), no HCl reaction (with soil), strong cementation, coarse gravel fracture	ML	-40.1				
					110	S-41, SPT 5+25/0" REC=6", 33%	110.0 - 111.6 ft: hard drilling, slow penetration with slight rig chatter (possible shells & cemented sands)
113.0	113.0 - 118.0 ft: SILTY SAND, fine to medium grained sand, moist, gray with speckles of white, estimated 5 - 10% shell fragments, moderately to highly weathered shell fragments, weak to strong HCl reaction (with shells), no HCl reaction (with soil)	SM	-45.1				
					115	S-42, SPT 3+5+9 REC=18", 100%	115.0 ft: smooth drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
118.0	118.0 - 123.0 ft: SANDY SILT, fine to medium grained sand, moist, olive gray, estimated <5% shell fragments, contains mica, strong HCl reaction, homogenous structure, moderately weathered shell fragments	SM	-50.1				
		ML			120 S-43, SPT 4+7+9 REC=18", 100%		120.0 - 121.5 ft: SPT Hammer Energy Test performed
123.0	123.0 - 128.0 ft: SANDY LEAN CLAY, fine to medium grained sand, moist, olive gray, contains mica, strong HCl reaction, homogenous structure	CL	-55.1		125 S-44, SPT 4+9+11 REC=18", 100%		120.0 - 125.0 ft: fine to medium sand, coarse sand sized shell fragments and som small (<1/4") silt clumps in cuttings
128.0	128.0 - 133.0 ft: CLAYEY SAND, fine to medium grained sand, moist, olive gray with streaks of white, estimated 15 - 25% shell fragments, moderately to highly weathered shell fragments, strong HCl reaction (in shells), weak HCl reaction (in soil)	SC	-60.1		130 S-45, SPT 4+4+5 REC=18", 100%		
133.0	133.0 - 140.8 ft: CLAYEY SAND, fine to medium grained sand, moist, olive gray, contains mica, no HCl reaction	SC	-65.1		135 S-46, SPT 8+10+15 REC=18", 100%		131.5 ft: approximately 30 ft of cave-in occurred over weekend, thickened bentonite drilling fluid (25 lbs)
							135.0 - 136.5 ft: SPT Hammer Energy Test performed

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
140.8	140.8 - 158.0 ft: SANDY LEAN CLAY, fine to medium grained sand, moist, olive gray, contains mica, weak HCl reaction, firm	SC	-72.9		140	S-47, SPT 4+5+10 REC=18", 100%		140.0 - 140.8 ft: jar labeled as S-47A 140.8 - 141.5 ft: jar labeled as S-47B
	145.0 ft: Changes to dark greenish gray				145	S-48, SPT 4+6+9 REC=18", 100%		145.0 - 150.0 ft: fine to medium sand size shell fragments, small ($<1/4$ ") clumps of clay in cuttings
	150.0 ft: Changes to grayish green, hard	CL			150	S-49, SPT 5+6+10 REC=18", 100%		150.0 - 151.5 ft: SPT Hammer Energy Test performed 150.0 - 155.0 ft: added ~ 2qts of "ThinZ-It" (Wyo-Ben) clay thinner to keep hole open and bit clean, driller slowed down drill rate
	155.0 ft: Changes to dark grayish green, strong HCl reaction				155	S-50, SPT 5+6+8 REC=18", 100%		155.0 - 160.0 ft: slightly darker mud (darker gray)

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
158.0	158.0 - 168.0 ft: SILTY SAND, fine to medium grained sand, moist, olive gray, contains mica, strong HCl reaction	CL	-90.1				155.0 - 160.0 ft: slightly darker mud (darker gray) (continued)
					160	S-51, SPT 5+8+10 REC=18", 100%	160.0 - 165.0 ft: with significant amount of clay in cuttings
					165		
168.0	168.0 - 179.0 ft: SILTY SAND, fine to medium grained sand, moist, olive gray, contains mica, strong HCl reaction	SM	-100.1				165.0 - 166.5 ft: SPT Hammer Energy Test performed
					170	S-53, SPT 6+7+10 REC=18", 100%	
					175	S-54, SPT 5+8+10 REC=18", 100%	
	173.0 ft: Changes to weak HCl reaction	SM					

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
179.0	179.0 - 185.0 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, wet, dark gray with speckles of brownish white, estimated 5 - 10% shell fragments, moderate to highly weathered shell fragments, strong HCl reaction (in shells), no HCl reaction (in soil)	SM	-111.1		180 S-55, SPT 7+10+14 REC=16", 89%		180.0 - 181.5 ft: SPT Hammer Energy Test performed 180.0 - 185.0 ft: intermittent smooth to slightly harder drilling (described by driller as "crunchy", possibly shell fragments), (added ~ 35 lbs of bentonite powder)
185.0	185.0 - 193.0 ft: SILTY SAND, fine to medium grained sand, wet, olive gray, estimated <5% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (in shells), no HCl reaction (in soil)	SP-SM	-117.1		185 S-56, SPT 3+4+9 REC=17", 71%		185.0 - 186.0 ft: 140 ft of rods dropped in borehole, penetrated soil 16", pulled rods and drilled to 186.5 to take next sample
190.0	190.0 ft: Changes to no HCl reaction	SM			190 S-57, SPT 3+4+9 REC=18", 100%		186.5 - 190.0 ft: fine to medium sand with clumps of clays/silt in cuttings
193.0	193.0 - 200.0 ft: SANDY ELASTIC SILT, fine to medium grained sand, moist, grayish green, contains mica, weak HCl reaction	MH	-125.1		195 S-58, SPT 4+6+14 REC=18", 100%		195.0 - 196.5 ft: SPT Hammer Energy Test performed

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-348**
Schnabel No.: 06120048
Sheet: 11 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
200.0		MH	132.1		200	S-59, SPT 4+5+8 REC=9.5", 53%		

Bottom of Boring at 200.0 ft.
Boring backfilled with cement/bentonite grout upon completion.

DRAFT

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-349
Schnabel No.: 06120048
Sheet: 1 of 5

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo)

Method: 4-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-Cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/1/08 **Finished:** 7/2/08

Easting: 960537.5 ft **Northing:** 217396.4 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 54.4 (ft) **Total Depth:** 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/1	5:45 PM	5.0'	5.0'	---
End of Day	7/1	6:40 PM	4.4'	9.5'	---
Start of Day	7/2	7:15 AM	4.5'	9.5'	---
Completion	7/2	12:50 PM	16.0'	9.5'	52.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.0 - 1.5 ft	ORGANIC SOIL							
1.5			52.9			S-1, SPT 1+1+2 REC=15", 83%		0.0 - 2.5 ft: Advanced 4 1/4 inch I.D. HSA to 9.5 ft 0.0 to 2.5 ft interval uniform resistance, smooth drilling, light brown cuttings, used pilot bit to clear augers. Changes as noted below. See end of boring log for additional remarks
2.0	1.5 - 2.0 ft: SILTY SAND, medium to coarse grained sand, subangular particles, moist, brown, estimated <5% fine gravel, no HCl reaction	SM	52.4					5.0 - 7.5 ft: orangish brown cuttings
	2.0 - 4.5 ft: POORLY GRADED SAND, fine to coarse grained sand, subrounded particles, moist, dark gray and brownish orange, estimated <5% fine gravel, estimated <5% clay, no HCl reaction, subrounded gravel	SP				S-2, SPT 2+4+6 REC=15", 83%		5.0 - 6.1 ft: jar labeled as S-3A
4.5			49.9		5	S-3, SPT 3+4+3 REC=15", 83%		6.1 - 6.5 ft: jar labeled as S-3B
6.1	4.5 - 6.1 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, reddish orange and light gray, with bands of reddish orange, no HCl reaction	SP-SM	48.3					7.8 ft: dark gray cuttings
	6.1 - 12.5 ft: LEAN CLAY, moist, dark gray, contains mica, no HCl reaction, soft					S-4, SPT 1+2+5 REC=18", 100%		9.5 ft: switch to 3 1/2 inch O.D. tricone roller bit (mud rotary) and advanced to 100 ft, one bag bentonite mixed with 125 gallons of water
	7.5 ft: Changes to firm	CL			10	S-5, SPT 2+5+6 REC=18", 100%		9.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
12.5			41.9					10.0 - 13.5 ft: large pieces of lean clay cuttings
	12.5 - 17.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, contains mica, no HCl reaction	SP-SM			15	S-6, SPT 2+4+6 REC=18", 100%		
17.5			36.9					
	17.5 - 22.5 ft: SILTY SAND, fine grained sand, moist, dark gray, estimated 5 - 10% fine to coarse gravel, no HCl reaction, moderate cementation, gravel as cemented sand fragments	SM				S-7, SPT 50/5" REC=5", 104%		18.5 - 23.5 ft: increased resistance

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
		SM						18.5 - 23.5 ft: increased resistance (continued)
22.5	22.5 - 27.0 ft: POORLY GRADED SAND, fine to coarse grained sand, subrounded particles, wet, dark gray, estimated <5% shell fragments, coarse sand size moderately to highly weathered shell fragments, strong HCl reaction (with shells), strong HCl reaction (with soil)	SP	31.9		25	S-8, SPT 50/5" REC=5", 100%		23.5 - 28.5 ft: uniform drilling resistance, gray drilling fluid
27.0	27.0 - 32.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated 15 - 25% shell fragments, fine to medium gravel size fresh shell fragments, strong HCl reaction (with shells), strong HCl reaction (with soil)	SP-SM	27.4		30	S-9, SPT 29+34+19 REC=15", 83%		28.5 - 33.5 ft: gradual decrease in drilling resistance, smooth drilling
32.0	32.0 - 37.0 ft: SILTY SAND, fine grained sand, moist, dark gray, estimated <5% shell fragments, medium to coarse gravel size highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SM	22.4		35	S-10, SPT 4+5+6 REC=18", 100%		33.5 - 38.5 ft: uniform drilling resistance
37.0	37.0 - 42.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, estimated <5% shell fragments, strong cementation, fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	17.4		40	S-11, SPT 16+50/4" REC=9", 94%		38.5 - 43.5 ft: resistance increased and decreased intermittently with bit chatter when drilling resistance increased (possible shells)
42.5	42.5 - 47.0 ft: SILTY SAND, fine to medium grained sand, wet, dark gray, estimated 5 - 10% shell fragments, coarse sand to fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	11.9		45	S-12, SPT 7+6+11 REC=18", 100%		43.5 - 48.5 ft: uniform drilling resistance, smooth drilling

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
47.0	47.0 - 57.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated 5 - 10% shell fragments, fine to medium gravel size fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	7.4					
					50	S-13, SPT 7+7+10 REC=18", 100%		
	53.5 ft: Changes to estimated <5% shell fragments				55	S-14, SPT 4+5+8 REC=14", 78%		53.5 - 58.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
57.0	57.0 - 62.0 ft: POORLY GRADED, fine to medium grained sand, wet, dark gray, estimated <5% silt, estimated <5% shell fragments, coarse sand size highly weathered shell fragments, no HCl reaction (with shells), no HCl reaction (with soil)	SP	-2.6		60	S-15, SPT 5+5+7 REC=18", 100%		
62.0	62.0 - 67.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, dark gray, estimated <5% shell fragments, fine gravel size highly weathered shell fragments, contains mica, weak HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-7.6		65	S-16, SPT 5+5+9 REC=12", 67%		63.5 - 68.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
67.0	67.0 - 72.0 ft: SILTY SAND, fine to medium grained sand, wet, gray, estimated 5 - 10% shell fragments, estimated <5% fine gravel, strong cementation, coarse sand to medium gravel size highly weathered shell fragments, gravel as cemented sand, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-12.6		70	S-17, SPT 10+10+11 REC=18", 100%		
72.0	72.0 - 87.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated <5% shell fragments, fine to coarse gravel size highly weathered shell fragments,	SP-SM	-17.6			S-18, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	strong HCl reaction (with shells), weak HCl reaction (with soil)				75	11+12+17 REC=18", 100%		73.5 - 78.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid (continued)
	78.5 ft: Changes to moist				80	S-19, SPT 13+10+10 REC=18", 100%		
	83.5 ft: Changes to wet, estimated <5% shell fragments, no HCl reaction, coarse sand to fine gravel size moderately to highly weathered shell fragments,	SP-SM			85	S-20, SPT 9+10+15 REC=18", 100%		83.5 - 88.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
87.0	87.0 - 92.5 ft: SILTY SAND, fine grained sand, moist, dark gray, estimated <5% shell fragments, fine gravel size highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SM	-32.6		90	S-21, SPT 6+10+15 REC=18", 100%		
92.5	92.5 - 97.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, estimated <5% shell fragments, coarse sand to fine gravel size highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil).	SP-SM	-38.1		95	S-22, SPT 8+8+11 REC=18", 100%		93.5 - 98.5 ft: uniform drilling resistance, smooth drilling gray drilling fluid
97.0	97.0 - 100.0 ft: POORLY GRADED SAND WITH SILT, moist, dark gray, estimated <5% shell fragments, fine to coarse gravel size fresh to highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-42.6			S-23, SPT 6+12+50 REC=18", 100%		
100.0			-45.6		100			

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-349**
Schnabel No.: 06120048
Sheet: 5 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	Bottom of Boring at 100.0 ft. Boring backfilled with bentonite and cement grout using a tremie upon completion.							
DRAFT								

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-350**
Schnabel No.: 06120048
Sheet: 1 of 6

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 6/30/08 Finished: 6/30/08

Easting: 960789 ft Northing: 217516.2 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 46.6 (ft) Total Depth: 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	6/30	4:09 PM	13.5'	13.5'	---
Completion	6/30	7:11 PM	10.0'	14.5'	20.5'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.0 - 1.0 ft	Topsoil, contains roots							
1.0	1.0 - 2.0 ft: SILTY SAND, fine to medium grained sand, moist, brown, contains roots, no HCl reaction	SM	45.6			S-1, SPT 2+1+2 REC=7", 39%		0.0 - 2.5 ft: Advanced 4 1/4" I.D. HSA to 14.5 ft; Uniform drilling resistance, smooth drilling, brown cuttings, used pilot bit; changes noted below
2.0	2.0 - 4.5 ft: SANDY LEAN CLAY, fine grained sand, moist, brown, contains roots, no HCl reaction	CL	44.6			S-2, SPT 2+4+6 REC=14", 78%		
4.5	4.5 - 7.0 ft: LEAN CLAY, moist, light gray with bands of brownish orange, estimated <5% fine grained sand, no HCl reaction, Iron oxidation bands	CL	42.1		5	S-3, SPT 2+5+6 REC=17", 94%		
7.0	7.0 - 9.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, light gray with bands of brownish orange, no HCl reaction, Iron oxidation bands	SP-SM	39.6			S-4, SPT 1+3+5 REC=16", 89%		7.5 - 9.0 ft: orangish brown cuttings
9.5	9.5 - 12.5 ft: SILTY SAND, fine grained sand, moist, light brown with bands of brownish orange, no HCl reaction, Iron oxidation bands	SM	37.1		10	S-5, SPT 4+5+5 REC=18", 100%		10.0 - 13.5 ft: brown cuttings
12.5	12.5 - 17.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, orangish brown and light gray, no HCl reaction	SP-SM	34.1			S-6, SPT 2+2+2 REC=10", 56%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
17.0	17.0 - 22.5 ft: POORLY GRADED SAND, fine to medium grained sand, wet, orangish brown, estimated <5% silt, no HCl reaction	SP-SM	29.6					14.5 - 18.5 ft: Switch to 3 1/2" O.D. tricone roller bit (mud rotary) and advance to 100 ft, one bag of bentonite mixed with about 125 gallons of water to make drilling fluid. Uniform drilling resistance, smooth drilling, gray drilling fluid (continued)
22.5	22.5 - 28.0 ft: SILTY SAND, fine grained sand, wet, dark gray, contains mica, estimated 15 - 25% shell fragments, coarse sand size fresh shells, strong HCl reaction (with shells and soil)	SP	24.1		20	S-7, SPT 6+2+3 REC=11", 61%		18.5 - 23.5 ft: brownish gray drilling fluid.
28.0	28.0 - 32.0 ft: SILTY SAND, wet, dark gray, contains mica, no HCl reaction	SM	18.6		25	S-8, SPT 4+6+5		23.5 - 28.5 ft: gray drilling fluid
32.0	32.0 - 36.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, contains cemented sands, coarse sand size fresh shells, strong HCl reaction (with shells and soil), moderate cementation	SM	14.6		30	S-9, SPT 10+10+25 REC=18", 100%		28.0 ft: increased drilling resistance
		SP-SM			35	S-10, SPT 50/5" REC=5", 104%		28.5 - 33.5 ft: Uniform drilling resistance, smooth drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
36.5	36.5 - 47.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated 5 - 10% shell fragments, coarse sand to coarse gravel size moderately weathered shells, strong HCL reaction (with shells), weak HCL reaction (with soil)	SP-SM	10.1					36.5 ft: decreased drilling resistance
					40	S-11, SPT 4+5+6		
					45	S-12, SPT 5+5+8 REC=16", 89%		38.5 - 43.5 ft: Uniform drilling resistance, smooth drilling
47.0	47.0 - 52.0 ft: POORLY GRADED SAND, fine grained sand, wet, dark gray, estimated <5% silt, estimated <5% shell fragments, coarse sand size moderately weathered shell fragments, weak HCL reaction (with shells and soil)	SP	-0.4					
					50	S-13, SPT 3+4+6 REC=17", 94%		
52.0	52.0 - 58.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, contains mica, estimated <5% shell fragments, strong HCL reaction (with shells and soil), highly weathered shell fragments	SP-SM	-5.4					
					55	S-14, SPT 2+4+7 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
58.0	58.0 - 63.0 ft: CLAYEY SAND WITH GRAVEL, fine to medium grained sand, wet, light gray, contains cemented sands, estimated 5 - 10% shell fragments, fine gravel size fresh shell fragments, gravel as cemented sand, strong HCL reaction (with shells and soil)	SP-SM	-11.4					
		SC			60	S-15, SPT 48+50/5" REC=11", 102%		58.0 ft: increased drilling resistance and bit chatter
63.0	63.0 - 66.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated 5 - 10% fine to medium gravel, estimated <5% shell fragments, highly weathered shell fragments, gravel as cemented sands, strong HCL reaction (with shells and soil)	SP-SM	-16.4					
					65	S-16, SPT 20+50/5" REC=11", 65%		63.0 ft: bit chatter
66.0	66.0 - 72.0 ft: POORLY GRADED SAND, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, fine to coarse gravel size highly weathered shell fragments, strong HCL reaction (with shells), weak HCL reaction (with soil)	SP	-19.4					
					70	S-17, SPT 6+11+13 REC=18", 100%		66.0 ft: decreased drilling resistance
72.0	72.0 - 77.0 ft: SILTY SAND, fine grained sand, moist, dark gray, estimated 5 - 10% shell fragments, coarse sand to coarse gravel size moderately weathered to fresh shell fragments, strong HCL reaction (with shells and soil)	SM	-25.4					
					75	S-18, SPT 11+11+12 REC=18", 100%		68.5 - 73.5 ft: uniform drilling resistance, smooth drilling
								73.5 - 78.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-350
Schnabel No.: 06120048
Sheet: 5 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
77.0	77.0 - 82.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, estimated <5% shell fragments, fine to coarse gravel size highly weathered shell fragments, strong HCL reaction (with shells), no HCL reaction (with soil)	SM	-30.4					73.5 - 78.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid (continued)
		SP-SM			80	S-19, SPT 6+8+12 REC=18", 100%		
82.0	82.0 - 92.0 ft: SILTY SAND, fine grained sand, moist, dark gray, no HCL reaction		-35.4					83.5 - 88.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
					85	S-20, SPT 8+8+12 REC=18", 100%		
		SM						
	88.5 ft: Changes to estimated <5% shell fragments, fine to coarse gravel size highly weathered shell fragments, strong HCL reaction (with shells), no HCL reaction (with soil)				90	S-21, SPT 7+11+12 REC=18", 100%		
92.0	92.0 - 97.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, estimated 5 - 10% shell fragments, fine to coarse gravel size fresh to moderately weathered shell fragments. strong HCL reaction (with shells), weak HCL reaction (with soil)	SP-SM	-45.4					93.5 - 98.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
					95	S-22, SPT 9+9+16 REC=18", 100%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04 22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-350**
Schnabel No.: 06120048
Sheet: 6 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
97.0	97.0 - 100.0 ft: SILTY SAND, fine grained sand, moist, dark gray, contains mica, estimated <5% shell fragments, coarse sand and fine to coarse gravel size moderately to highly weathered shell fragments, strong HCl reaction (with shells and soil)	SP-SM	-50.4					93.5 - 98.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid (continued)
100.0		SM	-53.4		100	S-23, SPT 7+10+13 REC=18", 100%		

Bottom of Boring at 100.0 ft.

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

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TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-351**
Schnabel No.: 06120048
Sheet: 1 of 6

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 6/24/08 Finished: 6/25/08

Easting: 960538.1 ft Northing: 217072.7 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 71.3 (ft) Total Depth: 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ∇	6/24	---	58.5'	14.5'	---
Completion ∇	6/25	5:20 PM	13.0'	14.5'	22.2'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.5	0.0 - 0.5 ft: Rootmat and topsoil		70.8			S-1, SPT 1/12"+3 REC=14", 78%		0.0 - 2.5 ft: Advanced 4-1/4" ID HSA to 14.5 ft, uniform resistance, smooth drilling, orangish brown cuttings; changes as noted below
1.5	0.5 - 1.5 ft: SANDY LEAN CLAY, fine grained sand, moist, brown, estimated <5% fine gravel, no HCl reaction, soft, subrounded fine gravel	CL	69.8					
	1.5 - 7.5 ft: SILTY SAND, fine grained sand, moist, orangish brown with bands of reddish brown, no HCl reaction, contains 1-inch layer of subrounded fine gravel at 3.6 feet, contains iron oxidation banding	SM				S-2, SPT 4+10+13 REC=18", 100%		
	5.0 ft: Changes to fine to medium grained sand, estimated <5% fine gravel, subrounded fine gravel				5	S-3, SPT 2+4+3 REC=13", 72%		5.0 - 7.5 ft: pilot bit used to clear auger plug
7.5	7.5 - 8.0 ft: LEAN CLAY, moist, light gray, no HCl reaction, soft, contains a 1-inch layer of fine sand at 7.7 feet, contains a 0.5-inch layer of cemented sand at 7.9 feet (possibly iron oxidation cementation)	CL	63.8			S-4, SPT 2+3+3 REC=18", 100%		7.5 - 10.0 ft: Advanced 4-1/4" I.D. HSA, increased drilling resistance at 9.0 ft, cuttings changed to dark gray
8.0	8.0 - 9.0 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, contains mica, no HCl reaction, firm, contains 1/8-inch layer of silty sand, moist, orangish brown at 8.4 ft	CL	63.3					
9.0	8.4 ft: Changes to orangish gray		62.3					
	9.0 - 12.5 ft: LEAN CLAY, moist, dark gray, estimated <5% fine grained sand, no HCl reaction, firm	CL			10	S-5, SPT 3+3+4 REC=18", 100%		10.0 - 12.5 ft: Increased drilling resistance with depth, dark gray cuttings
12.5	12.5 - 15.0 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, contains mica, no HCl reaction, firm	CL	58.8			S-6, SPT 2+4+4 REC=18", 100%		12.5 - 14.5 ft: Uniform drilling resistance
								14.5 - 15.0 ft:

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
15.0	15.0 - 18.5 ft: LEAN CLAY WITH SAND, fine grained sand, moist, dark gray, contains mica, no HCl reaction, firm	CL	56.3			S-7, SPT 2+2+3 REC=17", 94%		Switched to 3-1/2" tricone roller bit (mud rotary) and advanced to 100 ft, uniform drilling resistance, smooth drilling, dark gray drilling fluid 15.0 - 18.5 ft: light gray drilling fluid
18.5	18.5 - 28.5 ft: LEAN CLAY, moist, dark gray, contains mica, estimated <5% fine grained sand, no HCl reaction, firm, contains 2-inch layer of sandy lean clay (CL), moist, dark gray at 23.5 ft	CL	52.8		20	S-8, SPT 3+4+6 REC=18", 100%		
					25	S-9, SPT 6+8+10 REC=18", 100%		23.5 - 28.5 ft: Uniform drilling resistance, smooth drilling, light gray drilling fluid
28.5	28.5 - 33.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, contains mica, no HCl reaction	SP-SM	42.8		30	S-10, SPT 7+8+11 REC=18", 100%		
33.0	33.0 - 38.5 ft: SILTY SAND WITH SILT AND GRAVEL, fine to medium grained sand, moist, dark gray, estimated <5% shell fragments, weak HCl reaction (with shells)	SM	38.3		35	S-11, SPT 28+50/5" REC=12", 67%		33.5 - 38.5 ft: Uniform drilling resistance, smooth drilling, dark gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
								33.5 - 38.5 ft: Uniform drilling resistance, smooth drilling, dark gray drilling fluid (continued)
						S-12, SPT 50/5" REC=5", 104%		
					40			
						S-13, SPT 15+15+19 REC=14", 78%		
	43.5 ft: Changes to estimated 15 - 25% shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)				45			43.5 - 48.5 ft: Uniform drilling resistance, smooth drilling, dark gray drilling fluid
		SM						
						S-14, SPT 3+5+22 REC=18", 100%		
	48.5 ft: Changes to estimated <5% shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)				50			48.5 - 53.5 ft: Increased drilling resistance at 51.0 ft, smooth drilling, dark gray drilling fluid
						S-15, SPT 6+23+10 REC=18", 100%		
	53.5 ft: Changes to estimated 15 - 25% shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil), weak to moderate cementation (fine sands and shells)				55			53.5 - 58.5 ft: Bit chatter from 56.5 to 57.0 ft (possible shell fragments/cemented sand), dark gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
								53.5 - 58.5 ft: Bit chatter from 56.5 to 57.0 ft (possible shell fragments/cemented sand), dark gray drilling fluid (continued)
	58.5 ft: Changes to wet, olive gray, strong HCl reaction (with shells), no HCl reaction (with soil), no cementation				60	S-16, SPT 6+8+10 REC=18", 100%		58.5 - 63.5 ft: Uniform drilling resistance, smooth drilling, dark gray drilling fluid
	63.5 ft: Changes to estimated <5% shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)				65	S-17, SPT 8+6+7 REC=18", 100%		63.5 - 68.5 ft: Uniform drilling resistance, smooth drilling, dark gray drilling fluid
		SM			70	S-18, SPT 7+7+10 REC=18", 100%		
	73.5 ft: Changes to no HCl reaction				75	S-19, SPT 5+7+11 REC=18", 100%		73.5 - 78.5 ft: Uniform drilling resistance, smooth drilling, dark gray drilling fluid

(continued)

**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number:**B-351****Schnabel No.:** 06120048**Sheet:** 5 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
								73.5 - 78.5 ft: Uniform drilling resistance, smooth drilling, dark gray drilling fluid (<i>continued</i>)
	78.5 ft: Changes to estimated 15 - 25% shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM			80	S-20, SPT 10+50/5" REC=11", 100%		78.5 - 83.5 ft: Bit chatter from 81.0 to 81.5 ft
	83.5 ft: Changes to gray				85	S-21, SPT 8+31+29 REC=18", 100%		83.5 - 88.5 ft: Bit chatter from 84.0 to 84.3 ft, dark gray drilling fluid
	88.5 ft: Changes to estimated <5% shell fragments, weak HCl reaction				90	S-22, SPT 7+12+17 REC=18", 100%		88.5 - 93.5 ft: Uniform drilling resistance
	93.5 ft: Changes to contains shell fragments, contains 0.5-inch layer of shells at 94.2 ft, contains a 2.5-inch layer of shells at 94.4 feet, strong HCl reaction (with shells), weak HCl reaction (with soil)				95	S-23, SPT 9+14+18 REC=18", 100%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-351**
Schnabel No.: 06120048
Sheet: 6 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
98.5	98.5 - 100.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray, no HCl reaction	SM	-27.2					
100.0		SP-SM	-28.7		100	S-24, SPT 10+11+18 REC=18", 100%		

Bottom of Boring at 100.0 ft.
Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

DRAFT



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-352**
Schnabel No.: 06120048
Sheet: 1 of 8

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: K. Bell

Equipment: CME- 95 (Truck); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-3/4" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/21/08 Finished: 7/24/08

Easting: 216829 ft Northing: 960894.7 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 110.2 (ft) Total Depth: 200.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/21	4:10 PM	18.5'	14.0'	---
End of Day	7/21	6:15 PM	-1.0'	14.0'	---
Start of Day	7/22	8:30 AM	9.0'	14.0'	---
End of Day	7/22	6:00 PM	1.0'	14.0'	---
Start of Day	7/23	7:00 AM	15.5'	14.0'	---
Completion	7/23	5:30 PM	12.5'	14.0'	---
End of Day	7/23	6:00 PM	12.5'	14.0'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	Start of Day STRATUM	7/24 SAMPLING DEPTH	7:30 AM DATA	37.0' TESTS	14.0' REMARKS
0.0 - 2.0	FILL, sampled as silty sand, fine to medium grained sand, moist, orangish brown, estimated <5% roots, contains mica, no HCl reaction	FILL	108.2			S-1, SPT 4+9+6 REC=18", 100%		0.0 - 2.5 ft: Advanced 4 1/4" ID HSA to 14 ft; Uniform drilling resistance, easy drilling, orangish brown; changes as noted below, see end of boring log for additional remarks
2.0 - 3.5	POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, orangish brown, contains mica, no HCl reaction	SP-SM	106.7			S-2, SPT 2+1+2 REC=16", 89%		2.5 - 3.5 ft: Jar labeled as S-2A
3.5 - 4.5	POORLY GRADED SAND, fine grained sand, moist, yellowish brown, estimated <5% silt, no HCl reaction	SP	105.7		5	S-3, SPT 4+5+7 REC=15", 83%		3.5 - 4.0 ft: Jar labeled as S-2B
4.5 - 7.0	POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, brown and orangish brown, contains mica, no HCl reaction, contains a 3.5 inch layer of POORLY GRADED SAND (SP), fine sand, moist, orangish brown and yellowish brown, contains mica	SP-SM	103.2			S-4, SPT 12+16+21 REC=13.5", 75%		5.0 - 7.5 ft: Harder drilling near the bottom of the run
7.0 - 10.8	POORLY GRADED SAND, fine to coarse grained sand, subrounded particles, moist, yellowish brown and orangish brown, estimated <5% fine gravel, contains mica, no HCl reaction, stratified, subrounded to rounded fine gravel, contains layers of poorly graded sand with silt, 0.5 to 1.0 inch thickness	SP	99.4		10	S-5, SPT 14+17+13 REC=16", 89%		7.5 - 10.0 ft: Hard drilling (possible sand), orangish brown and yellowish brown cuttings
10.8 - 13.5	Changes to gray and yellowish brown, estimated <5% silt, estimated <5% coarse gravel, no HCl reaction, subrounded to rounded gravel							10.0 - 10.8 ft: Jar labeled as S-5A
13.5 - 17.0	CLAYEY SAND, fine to coarse grained sand, subrounded to subangular particles, moist, yellowish brown and brown, estimated <5% fine gravel, no HCl reaction, subangular to subrounded gravel	SC			15	S-6, SPT 7+6+6 REC=18", 100%		10.0 - 13.5 ft: Uniform drilling resistance, hard drilling
17.0 - 22.0	Changes to coarse grained sand, subrounded particles, orangish brown, medium to coarse sand from 14.1 to 14.4 ft		93.2					10.8 - 11.5 ft: Jar labeled as S-5B
22.0 - 200.0	POORLY GRADED SAND WITH SILT, fine to coarse grained sand, subrounded particles, wet, yellowish brown and orangish brown, estimated 5 - 10% fine gravel, no HCl reaction, subrounded fine gravel	SP-SM				S-7, SPT 8+8+6 REC=10", 56%		13.5 - 14.0 ft: orangish brown cuttings

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
22.0	22.0 - 27.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, light orangish brown, contains mica, no HCl reaction, homogenous structure	SP-SM	88.2				silt cuttings
		SP-SM			25	S-8, SPT 6+7+9 REC=10", 56%	23.5 ft: smooth drilling, brown drilling fluid
27.0	27.0 - 37.0 ft: CLAYEY SAND, fine to medium grained sand, wet, orangish brown, contains mica, no HCl reaction		83.2				
					30	S-9, SPT 3+3+3 REC=16", 89%	28.5 ft: Softer drilling, orangish brown and brown cuttings, clayey sand cuttings
	32.0 ft: Changes to fine grained sand, orangish brown and brown, no mica	SC					
					35	S-10, SPT 1+1/12" REC=15", 83%	33.5 - 38.5 ft: easy drilling, slightly harder drilling at 37 ft
37.0	37.0 - 47.5 ft: SANDY LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction, very soft, homogenous structure		73.2				
					40	S-11, SPT woh+1+2 REC=17", 94%	38.5 - 43.5 ft: uniform drilling resistance, soft drilling, orangish brown and brown, sandy lean clay cuttings
	43.5 ft: Changes to gray and light gray	CL					
					45	S-12, SPT 1+3+3 REC=18", 100%	43.5 - 48.5 ft: brown and gray drilling fluid, fine sandy clay cuttings

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
47.5	47.5 - 52.5 ft: LEAN CLAY, moist, gray and light gray, estimated <5% fine grained sand, no HCl reaction, firm, homogenous structure	CL	62.7					
		CL			50	S-13, SPT 3+4+5 REC=18", 100%		48.5 ft: driller de-sanded 150 gallons of drilling fluid, driller added 75 gallons of clean water with 1/2 bag of bentonite
52.5	52.5 - 60.5 ft: LEAN CLAY, moist, light gray, estimated <5% fine grained sand, contains mica, no HCl reaction, firm to hard, homogenous structure	CL	57.7					48.5 ft: smooth drilling, brown drilling fluid
		CL			55	S-14, SPT 4+5+7 REC=18", 100%		53.5 - 58.5 ft: slightly harder drilling, light gray drilling fluid
	59.0 ft: Changes to 0.5 inch layer of silty sand, fine sand particles, wet, gray, no HCl reaction	CL						
		CL			60	S-15, SPT 5+7+9 REC=18", 100%		58.5 - 61.0 ft: easy drilling, light gray drilling fluid, lean clay cuttings
60.5	60.5 - 65.5 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, contains mica, no HCl reaction, very soft to soft, homogenous structure	CL	49.7					
		CL				S-16, SPT 5+5+6 REC=12", 67%		61.0 - 63.5 ft: bit clogged with clay while lowering; driller pulled and cleaned bit; smooth drilling, gray drilling fluid
		CL			65	S-17, SPT 7+9+15 REC=18", 100%		63.5 - 66.0 ft: easy drilling, light gray drilling fluid
65.5	65.5 - 68.0 ft: SILTY SAND, fine to medium grained sand, moist, dark gray, contains mica, estimated <5% shell fragments, weak cementation, fine sand size highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	44.7					
		SM				S-18, SPT 38+50/3" REC=9", 100%		66.0 - 68.5 ft: slight rig chatter at 68 ft (possible cemented sand)
68.0	68.0 - 70.5 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, rounded to subrounded particles, moist, gray and light gray, contains mica, no HCl reaction, weak cementation from 68.5 to 68.6 ft	SP-SM	42.2					
		SP-SM			70	S-19, SPT 50/3" REC=3", 100%		68.5 - 71.0 ft: hard drilling, uniform drilling resistance
70.5	70.5 - 78.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated <5% shell fragments, fine sand size, highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil), contains a 0.5 inch layer of sandy silt, moist, gray, est < 5% shells (fine sand size highly weathered shells,	SP-SM	39.7					
		SP-SM				S-20, SPT 31+50/6" REC=9", 75%		71.0 - 73.5 ft: slightly easier drilling, light gray drilling fluid
						S-21, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	weak HCl reaction (with shells), no HCl reaction (with soil), soft at 71.0 ft 73.5 ft: Changes to gray and light gray, homogenous structure, weak HCl reaction (with shells and soil)	SP-SM			50/5" REC=5", 100%		73.5 - 76.0 ft: smooth drilling (continued)
78.0	78.0 - 84.5 ft: SILTY SAND, fine to medium grained sand, wet, gray and white, estimated <5% fine gravel, estimated 30 - 45% shells, strong cementation, subrounded fine gravel as cemented sand, fine to medium sand size fresh to moderately weathered white shells, strong HCl reaction (with shells), weak HCl reaction (with soil) 81.0 ft: Changes to weak cementation, fine sand to fine gravel size fresh to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil) 83.5 ft: Changes to weak HCl reaction (with shells and soil)	SM	32.2		S-22, SPT 50/4" REC=4", 100%		78.5 - 81.0 ft: hard drilling, gray drilling fluid
84.5	84.5 - 85.5 ft: SANDY SILT, moist, gray, estimated 5 - 10% fine gravel, estimated <5% shells, fine to medium sand size fresh shells, weak HCl reaction (with shells), no HCl reaction (with soil)	ML	25.7		S-23, SPT 16+13+17 REC=13", 72%		81.0 - 83.5 ft: harder drilling, (possible shells and cemented sands)
85.5	85.5 - 88.0 ft: SILTY SAND, fine to medium grained sand, wet, gray and brownish gray, estimated <5% fine gravel, no HCl reaction, subangular fine gravel, fine gravel as cemented sand, moderate to strong cementation	SM	24.7		S-24, SPT 12+14+16 REC=15", 83%		83.5 - 85.0 ft: Jar labeled as S-25A
88.0	88.0 - 93.0 ft: SILTY SAND, fine to medium grained sand, wet, gray and light gray, estimated 5 - 10% shells, estimated <5% fine gravel, fine to medium sand size, fresh to highly weathered shells, angular fine gravel as cemented sand, weak HCl reaction (with shells), no HCl reaction (with soil), moderate to strong cementation (below 89.0 ft)	SM	22.2		S-25, SPT 5+2+7 REC=18", 100%		84.5 - 85.0 ft: Jar labeled as S-25B
93.0	91.0 ft: Changes to fine sand to fine gravel size fresh to moderately weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	17.2		S-26, SPT 34+50/4" REC=8", 80%		85.5 ft: very hard drilling (possible cemented sands)
	93.0 - 100.5 ft: SILTY SAND, fine to medium grained sand, wet, gray and light gray, estimated 5 - 10% shells, fine sand to fine gravel size fresh to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil), shell size decreases with depth	SM			S-27, SPT 5+50/6" REC=12", 100%		87.0 ft: hard drilling, slight rig chatter (possible cemented sand) 88.0 ft: softer drilling
	96.0 ft: Changes to gray, homogenous structure, fine to medium sand size, moderately to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SM			S-28, SPT 12+17+19 REC=18", 100%		89.0 ft: slight rig chatter (possible cemented sand), light gray drilling fluid
	98.5 ft: Changes to fine sand to fine gravel size fresh to highly weathered shells	SM	9.7		S-29, SPT 7+6+7 REC=18", 100%		92.5 ft: harder drilling (possible shells) 93.5 - 96.0 ft: uniform drilling resistance, smooth drilling
100.5		SM			S-30, SPT 5+9+14 REC=16", 89%		
					S-31, SPT 5+5+7 REC=18", 100%		98.5 - 101.0 ft: gray and light gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
100.5 - 105.5	100.5 - 105.5 ft: SILTY SAND, fine grained sand, wet, gray, estimated <5% shells, homogenous structure, fine to medium sand size moderate to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil) 103.5 ft: Changes to gray and light gray, estimated <5% shells, fine to medium sand size fresh to highly weathered shells	SM				S-32, SPT 4+5+7 REC=18", 100%		
105.5			4.7		105	S-33, SPT 5+6+8 REC=18", 100%		
105.5 - 108.0	105.5 - 108.0 ft: SILTY SAND, fine grained sand, wet, gray, no HCl reaction, homogenous structure, contain a 0.5 inch layer of sandy silt, moist, light gray at 106.9 ft	SM				S-34, SPT 3+3+4 REC=18", 100%		
108.0			2.2					
108.0 - 110.5	108.0 - 110.5 ft: SILTY SAND, fine grained sand, wet, light gray, estimated <5% shells, homogenous structure, fine to medium sand size moderate to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SM			110	S-35, SPT 3+4+6 REC=18", 100%		108.5 ft: light gray drilling fluid
110.5			-0.3					
110.5 - 113.0	110.5 - 113.0 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated <5% shells, firm, fine to medium sand size moderately to highly weathered shells, weak HCl reaction (with shells and soil), contains 2.4 inch layer of silty sand from 112.3 to 112.5 ft; fine to medium sand, wet, olive gray and light gray, est 5 - 10% shells, fine sand to fine gravel size fresh to moderately weathered shells, weak HCl reaction (with shells and soil)	ML				S-36, SPT 3+5+6 REC=18", 100%		
113.0			-2.8					
113.0 - 115.5	113.0 - 115.5 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated 5 - 10% shells, soft, fine sand to coarse sand size fresh to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil); contains a 3.5 inch layer of silty sand, from 113.2 to 113.5 ft, fine to coarse sand, subrounded particles, wet, gray and white, est 5 - 10% subangular fine gravel as cemented sand, est 5 - 10% shells, fine to medium sand size fresh to highly weathered shells, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM			115	S-37, SPT 6+19+14 REC=18", 100%		114.0 ft: slight rig chatter (possible shells)
115.5			-5.3					
115.5 - 118.0	115.5 - 118.0 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated 5 - 10% shells, soft, fine sand to coarse sand size fresh to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil); contains a 3.5 inch layer of silty sand, from 113.2 to 113.5 ft, fine to coarse sand, subrounded particles, wet, gray and white, est 5 - 10% subangular fine gravel as cemented sand, est 5 - 10% shells, fine to medium sand size fresh to highly weathered shells, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM				S-38, SPT 7+8+8 REC=18", 100%		115.5 ft: heavy rig chatter (possible cemented sand)
118.0			-7.8					116.0 - 118.5 ft: uniform drilling resistance, smooth drilling
118.0 - 120.5	118.0 - 120.5 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated 5 - 10% shells, soft, fine sand to coarse sand size fresh to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil); contains a 3.5 inch layer of silty sand, from 113.2 to 113.5 ft, fine to coarse sand, subrounded particles, wet, gray and white, est 5 - 10% subangular fine gravel as cemented sand, est 5 - 10% shells, fine to medium sand size fresh to highly weathered shells, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM			120	S-39, SPT 40+19+27 REC=18", 100%		118.5 - 121.0 ft: slightly harder drilling, gray drilling fluid
120.5			-10.3					
120.5 - 125.0	120.5 - 125.0 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated 5 - 10% shells, soft, fine sand to coarse sand size fresh to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil); contains a 3.5 inch layer of silty sand, from 113.2 to 113.5 ft, fine to coarse sand, subrounded particles, wet, gray and white, est 5 - 10% subangular fine gravel as cemented sand, est 5 - 10% shells, fine to medium sand size fresh to highly weathered shells, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM				S-40, SPT 8+12+10 REC=18", 100%		121.0 - 123.5 ft: smooth drilling
125.0					125	S-41, SPT 7+7+11 REC=17", 94%		123.5 - 126.0 ft: easy drilling
125.0 - 128.5	125.0 - 128.5 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated 5 - 10% shells, soft, fine sand to coarse sand size fresh to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil); contains a 3.5 inch layer of silty sand, from 113.2 to 113.5 ft, fine to coarse sand, subrounded particles, wet, gray and white, est 5 - 10% subangular fine gravel as cemented sand, est 5 - 10% shells, fine to medium sand size fresh to highly weathered shells, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM				S-42, SPT 5+8+12 REC=18", 100%		126.0 - 128.5 ft: smooth drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
128.5	120.5 - 128.5 ft: SILTY SAND, fine to medium grained sand, wet, olive gray, estimated 5 - 10% shells, fine to medium sand size moderately to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil) 123.5 ft: Changes to fine grained sand, estimated <5% shells, fine to medium sand size moderately to highly weathered shells, contains a 0.5 inch layer of silt at 124.3 ft, moist, olive gray, est < 5% fine sand particles, no HCl reaction, soft 126.0 ft: Changes to homogenous structure, fine sand size highly weathered shells 128.0 - 147.0 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated <5% shells, firm to soft, fine to medium sand size moderately to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil) 133.5 ft: Changes to firm, shells decrease with depth 138.5 ft: Changes to hard, homogenous structure, fine sand size highly weathered shells, no HCl reaction (with shells or soil) 143.5 ft: Changes to olive gray and grayish green, estimated <5% shells, fine to medium sand size moderately to highly weathered shells, weak HCl reaction (with shells and soil)	SM	-18.3			S-43, SPT 7+9+10 REC=18", 100%		
					130			
						S-44, SPT 5+5+9 REC=18", 100%		133.5 - 138.5 ft: light gray drilling fluid, sandy silt, fine to medium sand sized shell cuttings
					135			
						S-45, SPT 6+7+8 REC=18", 100%		137.0 ft: harder drilling
					140			138.5 - 143.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
						S-46, SPT 5+6+9 REC=18", 100%		143.5 - 148.5 ft: silt and fine sand cuttings
					145			
147.0	147.0 - 152.0 ft: SILTY SAND, fine grained sand, wet, olive gray, estimated 5 - 10% shells, fine to medium sand size fresh to moderately weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-36.8			S-47, SPT 6+7+10 REC=18", 100%		148.5 - 153.5 ft: olive gray drilling fluid
					150			
152.0	152.0 - 172.5 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated <5% shells, fine to medium sand size moderately to highly weathered shells, weak HCl reaction (with shells and soil)	ML	-41.8			S-48, SPT 4+5+8 REC=18", 100%		153.5 - 158.5 ft: easy drilling

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-352**
Schnabel No.: 06120048
Sheet: 7 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
					155			153.5 - 158.5 ft: easy drilling (continued)
	158.5 ft: Changes to olive gray, fine sand size moderate to highly weathered shells					S-49, SPT 5+6+9 REC=18", 100%		
					160			161.0 ft: harder drilling
	163.5 ft: Changes to fine to medium sand size moderate to highly weathered shells	ML				S-50, SPT 5+6+7 REC=18", 100%		163.5 - 168.5 ft: easy drilling
					165			
	168.5 ft: Changes to fine sand size highly weathered shells					S-51, SPT 4+5+7 REC=18", 100%		168.0 - 173.5 ft: smooth drilling
					170			
172.5	172.5 - 182.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm to hard, homogenous structure	ML	-62.3			S-52, SPT 5+6+7 REC=18", 100%		173.5 - 178.5 ft: soft drilling, olive gray and gray drilling fluid
					175			
						S-53, SPT 5+6+9 REC=18", 100%		178.5 - 183.5 ft: fine sand in cuttings 179.0 ft: harder drilling 180.0 ft: softer drilling
					180			

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
182.0	182.0 - 200.0 ft: SILT WITH SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shells, firm to hard, homogenous structure, fine sand size highly weathered shells, weak HCl reaction (with shells and soil)		-71.8					178.5 - 183.5 ft: fine sand in cuttings <i>(continued)</i> 183.5 - 188.5 ft: uniform drilling resistance, smooth drilling, olive gray and gray drilling fluid
					185	S-54, SPT 5+6+8 REC=18", 100%		
					190	S-55, SPT 5+6+9 REC=18", 100%		188.5 - 193.5 ft: olive gray drilling fluid
	193.5 ft: Changes to hard				195	S-56, SPT 6+9+10 REC=18", 100%		193.5 - 198.5 ft: easy drilling
200.0			-89.8		200	S-57, SPT 6+6+10 REC=18", 100%		

Bottom of Boring at 200.0 ft.

NOTE: Negative groundwater depth denotes water level above ground surface (i.e. "negative depth"), but does not necessarily imply artesian conditions.



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-353**
Schnabel No.: 06120048
Sheet: 1 of 8

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: S. Effland

Schnabel Representative: K. Bell

Equipment: CME-75 (Truck); AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone Roller Bit
3-3/4" O.D. Tri-cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/16/08 Finished: 7/16/08

Easting: 460972.2 ft Northing: 216772.7 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 110.9 (ft) Total Depth: 200.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/16	3:00 PM	23.5'	14.0'	---
Start of Day	7/17	7:00 AM	3.5'	14.0'	---
Encountered	7/17	6:00 PM	-1.5'	14.0'	---
Start of Day	7/18	7:00 AM	10.5'	14.0'	---
Completion	7/21	8:20 AM	26.0'	14.0'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.2	0.0 - 0.2 ft: Topsoil		110.7					0.0 - 2.5 ft: Advanced 6 1/4 ID HSA to 14 ft: Uniform drilling, changes as noted below. See end of boring log for additional remarks.
2.0	0.2 - 2.0 ft: CLAYEY SAND, fine to medium grained sand, dry, yellowish brown and brown, contains mica, contains roots, no HCl reaction	SC	108.9			S-1, SPT 1+3+3 REC=13", 217%		
4.5	2.0 - 4.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, orangish brown and brown, contains mica, estimated <5% roots, no HCl reaction	SP-SM	106.4			S-2, SPT 1+2+2 REC=12", 40%		
7.0	4.5 - 7.0 ft: CLAYEY SAND, fine to medium grained sand, moist, orangish brown and brown, estimated <5% roots, no HCl reaction, sand size decrease with depth	SC	103.9		5	S-3, SPT 4+4+2 REC=15", 83%		5.0 - 7.5 ft: orangish brown cuttings
17.0	7.0 - 17.0 ft: POORLY GRADED SAND, fine to medium grained sand, dry, orangish brown and yellowish brown, no HCl reaction, homogenous structure, estimated <5% clay	SP-SM			10	S-4, SPT 4+6+6 REC=16", 89%		7.5 - 10.0 ft: orangish brown and brown cuttings
					15	S-5, SPT 4+7+7 REC=17", 94%		10.0 - 13.5 ft: slightly harder drilling
	13.5 ft: Changes to yellowish brown and brown, estimated <5% silt, no clay, contains a 1.0 inch layer of poorly graded sand with silt, dry, dark brown at 14.5 ft					S-6, SPT 3+6+5 REC=18", 100%		13.5 - 14.0 ft: Advance 6 1/4 ID HSA: Uniform drilling resistance, smooth drilling
	17.0 - 22.0 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, subrounded to subangular particles, moist, orangish brown and brown, contains mica, no HCl reaction, wet 0.5 inch at 18.9 ft, contains a 2.0 inch layer of clayey sand, fine to coarse sand, subangular	SP-SM	93.9			S-7, SPT 10+17+18 REC=15", 83%		14.0 ft: Switched to 3 1/2 OD Tricone roller bit (mud rotary), and advanced to 88.5 ft, 2 bags of bentonite mixed with 150 gallons of water. light brown drilling fluid

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
22.0	to subrounded coarse sand at 18.5 ft	SP-SM	88.9					21.0 - 21.5 ft: orangish brown drilling fluid
	22.0 - 31.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, orangish brown and gray, contains mica, no HCl reaction, sand size decreases with depth	SP-SM			25	S-8, SPT 4+6+5 REC=11", 61%		23.5 - 28.5 ft: slightly harder drilling, uniform drilling resistance
	27.0 ft: Changes to contains 2.0' layer of saturated soil at 30 ft, with speckles of black from 28.5 to 30 ft	SP-SM			30	S-9, SPT 5+7+4 REC=16", 89%		28.5 - 33.5 ft: from 31 to 31.5 ft, softer drilling
31.0	31.0 - 37.0 ft: SILTY SAND, fine to coarse grained sand, rounded to subrounded particles, wet, orangish brown (from 33.5 to 34 ft) reddish brown and gray (from 34 to 34.5 ft) gray (from 34.5 to 35 ft) sand size increases at color change depths, fine to medium sand at 34.5 ft, fine to coarse sand at 34.5 ft, contains a 0.5 inch layer of sandy lean clay, moist, gray at 33.7 ft.	SM	79.9		35	S-10, SPT 2+2+2 REC=18", 100%		
37.0	37.0 - 47.0 ft: SANDY LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction, soft, homogenous structure, contains a 1 inch layer of silty sand, fine sand, moist gray at 44.5 ft	CL	73.9		40	S-11, SPT 2+2+3 REC=19", 106%		
					45	S-12, SPT 2+3+4 REC=18", 100%		42.0 ft: harder drilling, drilling fluid changed to gray at 43.5 ft 43.5 - 48.5 ft: Uniform drilling resistance, easy drilling, gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
47.0	47.0 - 52.0 ft: LEAN CLAY, moist, gray, estimated <5% fine grained sand, no HCl reaction, firm to hard, homogenous structure	CL	63.9		S-13, SPT 2+4+5 REC=17", 94%		
52.0	52.0 - 57.0 ft: SANDY LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction, homogenous structure	CL	58.9		S-14, SPT 3+4+4 REC=17", 94%		53.5 - 58.5 ft: smooth drilling
57.0	57.0 - 61.0 ft: LEAN CLAY, moist, gray, estimated <5% fine grained sand, no HCl reaction, hard, homogenous structure, contains 0.5 inch layer of sandy lean clay at 59.5 ft	CL	53.9		S-15, SPT 4+6+7 REC=18", 100%		58.5 - 63.5 ft: slightly harder drilling at 61.0 ft, performed marsh funnel test performed 60 sec drilling fluid
61.0	61.0 - 67.0 ft: SANDY LEAN CLAY, fine grained sand, moist, gray and light gray, contains mica, no HCl reaction, firm, homogenous structure	CL	49.9		S-16, SPT 4+5+6 REC=18", 100%		
	63.5 ft: Changes to soft to very soft	CL			S-17, SPT 4+4+7 REC=15", 83%		63.5 - 66.0 ft: Uniform drilling resistance, smooth drilling. Driller de-sanded mud tub, driller added 50 gallons of clean water to drilling fluid, driller flushed hole with new drilling fluid.
	66.0 ft: Changes to hard to very hard				S-18, SPT 8+11+15 REC=17", 94%		66.0 - 68.5 ft: hard drilling at 67.5, light gray drilling fluid, 66-67.0 ft: jar labeled as S-18A, 67-67.5: jar labeled as S-18B
67.0	67.0 - 70.5 ft: SILTY SAND, fine to medium grained sand, moist, dark gray, contains mica, no HCl reaction, homogenous structure, moderate to strong cementation	SM	43.9		S-19, SPT 21+17+21 REC=17", 94%		68.5 - 71.0 ft: hard drilling
	68.5 ft: Changes to gray and light gray, estimated <5% shell fragments, fine sand size highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil), weak cementation				S-20, SPT 50/4" REC=4", 83%		
70.5	70.5 - 83.0 ft: POORLY GRADED SAND, fine grained sand, moist, light gray, estimated <5% silt, contains mica, no HCl reaction	SP	40.4		S-21, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
					75	50/6" REC=4", 67%		73.5 - 76.0 ft: fine sands gray in color, est < 5% fine shells (moderately weathered) (continued)
	76.0 ft: Changes to wet, estimated <5% shell fragments, fine to medium sand size, moderately to highly weathered, weak HCl reaction (both soil and shells)					S-22, SPT 50/3" REC=3", 83%		
	78.5 ft: Changes to fine to medium, fresh to highly weathered shell fragments, weak HCl reaction (with shells), no HCl (with soil)	SP			80	S-23, SPT 50/4" REC=4", 83%		78.5 - 81.0 ft: Driller De-sanded mud tub
	81.0 ft: Changes to fine to medium sand size highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soils), weak to moderate cementation					S-24, SPT 50/5" REC=4", 67%		
83.0	83.0 - 90.0 ft: SILTY SAND, fine to medium grained sand, wet, gray and light gray, estimated 30 - 45% shell fragments, fine sand to fine gravel size fresh to highly weathered shells, weak HCl reaction (shells and soil), moderate to strong cementation, fine gravel size cementation		27.9		85	S-25, SPT 23+18+14 REC=15", 83%		83.0 ft: rig chatter (possible cemented sand)
	85.5 ft: Changes to estimated 15 - 25% shell fragments, fine to coarse sand size shells, strong HCl reaction (with shells), weak HCl reaction (with soil at cemented sands), strong cementation	SM				S-26, SPT 3+50/3" REC=6", 63%		83.5 - 86.0 ft: hard drilling, slight rig chatter at 85.5 ft (possible cemented sand), light gray drilling fluid
90.0	88.5 ft: Changes to gray and olive gray, estimated 5 - 10% shell fragments, no HCl reaction, fine to medium sand size shells, weak HCl reaction (with shells and soils)		20.9		90	S-27, SPT 50/4" REC=4", 83%		86.0 - 88.5 ft: heavy rig chatter from 86.5 to 87.3 ft, softer drilling from 87.3 to 87.8 ft, rig chatter from 87.8 to 88.5 ft, marsh funnel test performed 45 sec drilling fluid
	90.0 - 93.0 ft: SILTY SAND, fine grained sand, wet, greenish gray and gray, estimated 5 - 10% shell fragments, fine to medium sand size, moderately to highly weathered shells, weak HCl reaction, (with soil and shells), moderate cementation fine to coarse sand size	SM				S-28, SPT 67/6" REC=5", 83%		88.5 ft: Driller switched to 3" OD Tricone roller bit, softer drilling at 90 ft, drilling fluid light gray, Driller switched to a 3 3/4 OD Tricone roller bit and advanced to 200.0 ft.
93.0	93.0 - 110.5 ft: SILTY SAND, fine grained sand, wet, olive gray, estimated <5% shell fragments, fine to coarse sand size fresh to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil)		17.9		95	S-29, SPT 9+11+11 REC=17", 94%		91.0 - 93.5 ft: slight rig chatter at 93 ft (possible cemented sand)
	96.0 ft: Changes to gray, estimated 5 - 10% shell fragments, fine sand to fine gravel size fresh to highly weathered shells, no HCl reaction with soil, weak HCl reaction with shells	SM				S-30, SPT 5+8+10 REC=18", 100%		93.5 - 96.0 ft: Uniform resistance, easy drilling, drilling marsh funnel test performed, 43 sec drilling fluid
	98.5 ft: Changes to gray and light gray, fine sand to fine gravel size shells, weak HCl Reaction (with soil and shells)				100	S-31, SPT 8+10+10 REC=18", 100%		96.0 - 98.5 ft: easy drilling, gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	101.0 ft: Changes to gray, estimated <5% shell fragments					S-32, SPT 7+9+14 REC=16", 89%		98.5 - 101.0 ft: harder drilling, driller used 100 gallons of drilling fluid, added 1/2 bag of bentonite to drilling (continued)
	103.5 ft: Changes to gray and olive gray, fine to coarse sand size highly to moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)					S-33, SPT 5+8+11 REC=17", 94%		101.0 - 103.5 ft: easy drilling
	105.5 ft: Changes to fine to medium sand size shell fragments, highly weathered, no HCl reaction (with shells), no HCl reaction (with soil)	SM			105	S-34, SPT 5+5+7 REC=17", 94%		103.5 - 106.0 ft: smooth drilling
	108.0 ft: Changes to contains mica, no HCl reaction					S-35, SPT 3+15+5 REC=17", 94%		106.0 - 108.5 ft: gray and olive gray drilling fluid
110.5	110.5 - 113.0 ft: SILTY SAND, fine grained sand, gray, estimated <5% shell fragments, fine sand size, highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	0.4		110	S-36, SPT 3+3+5 REC=18", 100%		108.5 - 110.0 ft: gray drilling fluid, marsh funnel test performed (45 sec drilling fluid)
113.0	113.0 - 118.0 ft: SILTY SAND, fine grained sand, wet, gray and white, estimated 15 - 25% shell fragments, fine sand to fine gravel size, fresh to highly weathered shells, weak HCl reaction (with shell and soil), shells increase with depth and have strong cementation around them. White shells	SM	-2.1		115	S-37, SPT 8+10+26 REC=14", 78%		115.0 ft: rig chatter (possible cemented shells), hard drilling
						S-38, SPT 14+15+17 REC=17", 94%		116.5 ft: rig chatter (possible cemented sand), hard drilling
118.0	118.0 - 123.0 ft: SILTY SAND, fine grained sand, wet, light gray, estimated 5 - 10% shell fragments, fine sand to coarse sand size, fresh to highly weathered shells, strong HCl reaction (with shells), weak HCl reaction (with soil), strong cementation around shells at 119.5 ft.	SM	-7.1		120	S-39, SPT 7+17+39 REC=17", 94%		118.5 - 121.0 ft: Rig chatter throughout (possible cemented sands)
	120.5 ft: Changes to fine sand to fine gravel size shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil), shells increase with depth.					S-40, SPT 10+11+17 REC=18", 100%		121.0 - 123.5 ft: smooth drilling, light gray drilling fluid
123.0	123.0 - 137.0 ft: SILTY SAND, fine grained sand, wet, gray and olive gray, estimated <5% shell fragments, fine sand size highly weathered shells, contains a 1.5 inch layer of sandy silt, wet, olive gray at 124.5 ft, weak HCl reaction (with shells and soil), shells decrease with depth.	SM	-12.1		125	S-41, SPT 12+13+13 REC=17", 94%		123.5 - 126.0 ft: gray drilling fluid
	126.0 ft: Changes to fine to coarse sand size fresh to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil), contains a 1.0 inch layer of					S-42, SPT 6+6+12 REC=18", 100%		126.0 - 128.5 ft: gray and dark gray drilling fluid

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-353
Schnabel No.: 06120048
Sheet: 6 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	sandy silt, moist, olive gray at 126.2 ft	SM						
	128.5 ft: Changes to fine sand to fine gravel size fresh to highly weathered shell fragments, weak HCl reaction (with shells and soil), shells increase with depth				130	S-43, SPT 4+9+15 REC=18", 100%		128.5 - 133.5 ft: Driller de-sanded 100 gallons of drilling fluid with 50 gallons of clean water to drilling fluid; driller flushed the hole with the new drilling fluid.
	133.5 ft: Changes to fine sand size highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil)				135	S-44, SPT 4+9+10 REC=18", 100%		133.5 - 138.5 ft: easy drilling light gray drilling fluid
137.0	137.0 - 173.5 ft: SANDY SILT, fine grained sand, moist, olive gray and grayish green, estimated <5% shells, fine sand size, highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil), hard to very hard homogenous	ML	-26.1		140	S-45, SPT 6+9+11 REC=18", 100%		138.5 - 143.5 ft: slightly faster drilling at 142 ft
	143.0 ft: Changes to fine to medium sand size fresh to highly weathered shell fragments, firm to hard, wet from 143.6 to 143.7 ft				145	S-46, SPT 4+7+8 REC=18", 100%		
	148.5 ft: Changes to fine sand to fine gravel size angular & fresh to highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)				150	S-47, SPT 4+5+6 REC=18", 100%		146.5 ft: harder drilling (possible sand) gray and greenish gray drilling fluid
	153.5 ft: Changes to fine to medium sand size moderately to highly weathered shell fragments, weak HCl					S-48, SPT 5+7+9 REC=18", 100%		148.5 - 153.5 ft: Uniform drilling resistance, easy drilling, gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	reaction (with shells and soil), soft to firm				155		153.5 - 158.5 ft: smooth drilling, olive gray drilling fluid (<i>continued</i>)
	158.5 ft: Changes to fine to medium sand size, highly weathered shell fragments, weak HCl reaction (with shells and soil), firm to hard				160	S-49, SPT 4+6+7 REC=18", 100%	158.5 - 163.5 ft: driller added ~ 1/2 bag of bentonite to ~30 gallons of clean water at 158.5 ft, marsh funnel test performed (48 drilling fluid), slower drilling, gray drilling fluid
	163.5 ft: Changes to fine sand size shells	ML			165	S-50, SPT 6+7+9 REC=18", 100%	163.5 - 168.5 ft: greenish gray and olive gray drilling fluid
	168.5 ft: Changes to fine sand size, highly weathered				170	S-51, SPT 5+5+7 REC=18", 100%	168.5 - 173.5 ft: steadily harder drilling from 172.0 ft + drilling fluid, gray and olive drilling fluid
173.5	173.5 - 197.0 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated <5% shells, fine sand size, highly weathered, weak HCl reaction (with shells and soil), firm to hard	ML	-62.6		175	S-52, SPT 5+6+7 REC=18", 100%	173.5 - 178.5 ft: Driller desanded 150 gallons of drilling fluid, and added 25 gallons of clean water, marsh funnel test performed (50 sec drilling fluid), light gray drilling fluid
					180	S-53, SPT 6+7+8 REC=18", 100%	178.5 - 183.5 ft: slightly hard drilling at 179 ft

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-353**
Schnabel No.: 06120048
Sheet: 8 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	183.5 ft: Changes to homogenous structure				185	S-54, SPT 5+7+9 REC=16", 89%		178.5 - 183.5 ft: slightly hard drilling at 179 ft (continued) 183.5 - 188.5 ft: easy drilling
					190	S-55, SPT 6+6+8 REC=16", 89%		188.5 - 193.5 ft: driller pumped 75 gallons of drilling fluid and filled the mud tub back up with clean water
					195	S-56, SPT 5+7+10 REC=18", 100%		193.5 - 198.5 ft: Advanced 3 3/4 OD Tricone Roller Bit; Progressively harder drilling with depth
197.0	197.0 - 200.0 ft: SANDY SILT, fine grained sand, moist, olive gray and grayish brown, estimated <5% shell fragments, (fine small size, highly weathered), weak HCl reaction (with soils and shells), hard, homogenous	ML	-86.1			S-57, SPT 6+8+9 REC=17", 94%		
200.0			-89.1		200			

Bottom of Boring at 200.0 ft.

Please refer to original field log for End of Day groundwater observation depths.



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-354**
Schnabel No.: 06120048
Sheet: 1 of 10

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: W. Wolfe

Schnabel Representative: D. Cepull

Equipment: CME-550; AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger
3-1/4" O.D. Tri-cone Roller Bit,
6" O.D. Tri-cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 6/23/08 Finished: 7/3/08

Easting: 961099.6 ft Northing: 217130.4 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 91± (ft) Total Depth: 251.5 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	6/23	4:29 PM	19.7'	18.5'	---
Start of Day	6/25	6:58 AM	27.0'	18.5'	---
Start of Day	6/27	7:30 AM	9.0'	18.5'	---
Start of Day	7/1	7:16 AM	29.0'	18.5'	---
Completion	7/2	5:11 PM	22.0'	18.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.3	0.0 - 0.3 ft: Topsoil		90.9			S-1, SPT 2+2+4 REC=13", 72%		0.0 ft: advanced 6 1/4" ID HSA to 18.5 ft; 0 to 1.5 ft interval uniform drilling resistance; changes as noted below, see end of boring log for additional remarks 2.5 - 2.9 ft: jar labeled as S-2A 2.9 - 4.0 ft: jar labeled as S-2B 5.0 - 7.5 ft: smooth drilling, orangish brown cuttings
2.9	0.3 - 2.9 ft: SILTY SAND, fine grained sand, moist, orangish brown, estimated <5% organics, organic odor, no HCl reaction	SM						
	2.5 ft: Changes to no organics, no odor		88.3			S-2, SPT 3+4+3 REC=14", 78%		
4.5	2.9 - 4.5 ft: WELL GRADED SAND, fine to coarse grained sand, subrounded particles, moist, orangish brown, no HCl reaction, contains 0.5 inch layer of (iron) cemented coarse sand and fine gravel at 3.7 ft. (fine gravel fracture)	SW	86.7		5	S-3, SPT 4+4+5 REC=16", 89%		
	4.5 - 7.0 ft: WELL GRADED SAND WITH SILT, fine to coarse grained sand, subrounded particles, moist, orangish brown, no HCl reaction	SW-SM	84.2					
7.0	7.0 - 9.5 ft: SILTY SAND, fine to coarse grained sand, subrounded particles, moist, orangish brown, estimated <5% fine gravel, no HCl reaction	SM	81.7		10	S-4, SPT 3+4+4 REC=18", 100%		
9.5	9.5 - 12.0 ft: POORLY GRADED SAND, fine to coarse grained sand, subrounded particles, moist, light orangish brown, estimated 5 - 10% fine gravel, no HCl reaction, (subrounded fine gravel)	SP	79.2			S-5, SPT 3+5+6 REC=14", 78%		
12.0	12.0 - 14.5 ft: CLAYEY SAND WITH GRAVEL, fine to coarse grained sand, subrounded particles, moist, orangish brown, no HCl reaction	SC	76.7		15	S-6, SPT 4+8+9 REC=16", 89%		
14.5	14.5 - 17.5 ft: SILTY SAND WITH GRAVEL, fine to coarse grained sand, subrounded particles, moist, orangish brown, (fine gravel); 0.25 inch layer of white clay at 15.8 ft	SM	73.7			S-7, SPT 4+9+11 REC=17", 94%		15.0 - 16.5 ft: hammer energy test performed
17.5	17.5 - 22.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, subangular particles, moist, light orangish brown, estimated <5% fine gravel, no HCl reaction, (subrounded gravel), contains 0.25 inch layer of	SP-SM				S-8, SPT 1+2+3 REC=14", 78%		
								18.5 ft: switched to 3 1/4" OD tricone roller bit (mud rotary) and

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	white clay at 19.6 and 19.8 ft	SP-SM						advanced to 196.5 ft; 18.5 to 23.5 ft interval, brown drilling fluid
22.0	22.0 - 24.2 ft: POORLY GRADED SAND WITH GRAVEL, fine to medium grained sand, subangular particles, wet, orangish brown, (subrounded fine gravel)	SP	69.2					
24.2	24.2 - 24.6 ft: FAT CLAY WITH SAND, fine grained sand, moist, light brown, estimated 5 - 10% fine and coarse sand, very hard	CH	67.0					23.5 - 24.2 ft: jar labeled as S-9A
24.6	24.6 - 28.0 ft: SANDY SAND, fine to medium grained sand, moist, dark orangish brown	SM	66.6		25	S-9, SPT 23+13+4 REC=17", 94%		23.7 - 24.2 ft: roller bit grinding, gray drilling fluid
28.0	28.0 - 42.0 ft: LEAN CLAY, moist, grayish brown, estimated <5% sand, contains mica, no HCl reaction, soft	CL	63.2		30	S-10, SPT 3+3+5 REC=18", 100%		24.2 - 24.6 ft: jar labeled as S-9B
					35	S-11, SPT 3+5+5 REC=18", 100%		28.5 - 33.5 ft: hammer energy test performed; little drilling resistance
					40	S-12, SPT 3+4+7 REC=18", 100%		33.5 - 35.0 ft: hammer energy test performed
					45	S-13, SPT 5+7+9 REC=18", 100%		35.0 ft: clay reducer added
42.0	42.0 - 44.5 ft: SANDY LEAN CLAY, moist, grayish brown, hard, clayey sand layer between 42.8 and 43 ft	CL	49.2					36.0 ft: increased drilling resistance
44.5	44.5 - 47.0 ft: SANDY LEAN CLAY, moist, grayish brown, no HCl reaction, soft	CL	46.7					37.5 ft: drilling resistance decreased
						S-14, SPT 10+8+11 REC=18", -60%		38.5 - 40.0 ft: uniform drilling resistance
						S-15, SPT 6+7+8 REC=12", 67%		45.0 - 46.5 ft: hammer energy test performed

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
47.0	47.0 - 50.8 ft: CLAYEY SAND, moist, grayish brown, contains mica, no HCl reaction	SC	44.2		S-16, SPT 5+5+6 REC=17", 94%		
50.8	50.8 - 52.0 ft: SILTY SAND, fine grained sand, moist, orangish brown, no HCl reaction, contains 0.5 inch layer of cemented sands at 50.6 ft, contains 1 inch layer of clayey sand at 51.4 ft, moist, fine sand, grayish brown with mica	SM	40.4		S-17, SPT 8+9+21 REC=16", 89%		50.0 - 50.8 ft: jar labeled as S-17A
52.0	52.0 - 54.5 ft: SILTY SAND, fine to coarse grained sand, moist, orangish brown, contains mica, no HCl reaction	SM	39.2		S-18, SPT 14+50/3" REC=9", 50%		50.8 - 51.5 ft: jar labeled as S-17B
54.5	53.6 ft: Changes to strong HCl reaction (with shells) at thin white seashell layer	SP	36.7		S-19, SPT 50/3" REC=1", 6%		51.0 ft: harder material encountered
57.0	54.5 - 57.0 ft: POORLY GRADED SAND, fine to medium grained sand, moist, light brown, no HCl reaction	SM	34.2		S-20, SPT 50/5" REC=5", 104%		52.5 - 55.0 ft: rig chatter at 53 ft, hard drilling throughout interval
59.5	57.0 - 59.5 ft: SILTY SAND, fine grained sand, moist, light brown, contains mica	SM	31.7		S-21, SPT 50/5" REC=5", 104%		55.0 - 57.5 ft: hard resistance drilling
62.5	59.5 - 64.5 ft: CLAYEY SAND, fine grained sand, wet, orangish brown, contains mica	SC	26.7		S-22, SPT 3+11+25 REC=12", 67%		61.0 ft: decreased drilling resistance
64.5	62.5 ft: Changes to contains shells, strong HCl reaction (with shells)	SM	24.2		S-23, SPT 50/6" REC=6", 33%		62.5 - 65.0 ft: moderately hard drilling resistance
67.0	64.5 - 67.0 ft: SILTY SAND, fine grained sand, wet, grayish brown, contains mica, contains shell fragments, weak HCl reaction (with shells)	SC	22.9		S-24, SPT 3+4+20 REC=18", 100%		65.0 - 67.5 ft: hard drilling resistance
68.3	67.0 - 68.3 ft: CLAYEY SAND, fine grained sand, moist, light brownish gray, estimated 5 - 10% shells, weak HCl reaction	SM			S-25, SPT 4+11+9 REC=18", 100%		67.5 - 68.3 ft: jar labeled as S-24A
	68.3 - 74.5 ft: SILTY SAND, fine grained sand, moist, brownish gray, weak HCl reaction				S-26, SPT 40+7+9 REC=18", 100%		68.3 - 69.0 ft: jar labeled as S-24B
	73.3 ft: Changes to estimated 5 - 10%						69.3 ft: extremely hard with considerable drilling resistance
							69.8 ft: broke through hard material
							72.0 ft: hard drilling resistance

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
74.5	shells	SM	16.7				
	74.5 - 92.0 ft: SILTY SAND, fine grained sand, wet, brownish gray, estimated 15 - 25% shell fragments, weak HCl reaction				75 S-27, SPT 50/5"		75.1 - 77.5 ft: extremely hard drilling resistance 75.4 ft: hammer energy test performed
	77.0 ft: Changes to estimated 5 - 10% shell fragments				S-28, SPT 5+5+7 REC=18", 100%		
	80.0 ft: Changes to estimated 15 - 25% shell fragments				80 S-29, SPT 5+4+7 REC=18", 100%		80.0 - 82.5 ft: uniform drilling, minor resistance
	82.5 ft: Changes to estimated 5 - 10% shell fragments	SM			S-30, SPT 6+5+6 REC=18", 100%		
	85.0 ft: Changes to no HCl reaction				85 S-31, SPT 5+4+7 REC=18", 100%		
	87.5 ft: Changes to estimated <5% shell fragments				S-32, SPT 4+4+7 REC=18", 100%		87.5 - 90.0 ft: uniform drilling resistance
	90.0 ft: Changes to moist, no shell fragments				90 S-33, SPT 6+4+6 REC=18", 100%		90.0 - 91.5 ft: slight to moderate drilling resistance, performed hammer energy test
92.0	92.0 - 97.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, brownish gray, no HCl reaction	SP-SM	-0.8		S-34, SPT 3+3+4 REC=18", 100%		90.0 ft: lost 350 gallons of drilling fluid in boring; after re-introduction of water and drilling fluid by drillers slow drilling fluid
					95 S-35, SPT 3+4+4 REC=10", 56%		92.5 - 95.0 ft: uniform drilling resistance, brownish gray drilling fluid
97.0	97.0 - 99.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, brownish gray, estimated 5 - 10% shells, (white shells), strong HCl reaction (with shells)	SP-SM	-5.8		S-36, SPT 15+20+20 REC=18", 100%		
99.5	99.5 - 109.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated 15 - 25% shell	SP-SM	-8.3		100 S-37, SPT 27+16+17		99.5 - 100.0 ft: some drilling resistance, light

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	fragments, weak HCl reaction (with shells)				REC=18", 100%		rod chatter
	102.5 ft: Changes to gray and white, estimated 5 - 10% shell fragments, (white shell fragments), weak HCl reaction (with shells)				S-38, SPT 5+22+31 REC=18", 100%		102.0 - 105.0 ft: uniform drilling resistance, light gray drilling fluid
	105.0 ft: Changes to estimated <5% shell fragments, (white shell fragments), weak HCl reaction (with shells)	SP-SM			S-39, SPT 12+23+22 REC=18", 100%		105.0 - 106.5 ft: hammer energy test performed
					S-40, SPT 9+14+18 REC=18", 100%		
109.5	109.5 - 127.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, contains shell fragments, (white shell fragments), weak HCl reaction with shells		-18.3		S-41, SPT 6+6+10 REC=18", 100%		110.0 - 113.5 ft: light to medium gray drilling fluid
					S-42, SPT 10+8+13 REC=18", 100%		
	118.5 ft: Changes to no HCl reaction	SP-SM			S-43, SPT 5+6+11 REC=18", 100%		118.5 - 120.0 ft: hammer energy test performed
	123.5 ft: Changes to no shell fragments				S-44, SPT 5+6+8 REC=18", 100%		
					S-45, SPT 5+6+10 REC=18", 33%		
127.0	127.0 - 142.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand,	SP-SM	-35.8				

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	moist, gray, contains shell fragments, weak HCl reaction (with shells), contains 0.25 inch layer of white shell fragments between 129.7 and 129.8						
	133.5 ft: Changes to estimated 5 - 10% shell fragments, (white shell fragments)				S-46, SPT 13+10+10 REC=18", 100%		133.5 - 135.0 ft: hammer energy test performed
	138.5 ft: Changes to contains shell fragments, moderate HCl reaction (with shells)				S-47, SPT 8+9+12 REC=18", 100%		138.5 - 140.0 ft: hammer energy test performed
142.5	142.5 - 152.5 ft: SANDY LEAN CLAY, fine grained sand, moist, grayish brown, weak HCl reaction, firm		-51.3		S-48, SPT 8+7+12 REC=18", 100%		143.5 - 145.0 ft: hammer energy test performed
	148.5 ft: Changes to estimated <5% shell fragments, hard, (white shell fragments), weak HCl reaction (with shells)				S-49, SPT 7+8+11 REC=18", 100%		148.5 - 150.0 ft: hammer energy test performed
152.5	152.5 - 167.0 ft: SANDY LEAN CLAY, fine grained sand, moist, grayish brown, no HCl reaction, hard		-61.3		S-50, SPT 4+5+7 REC=18", 100%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
154.8 ft: Changes to wet					155		153.5 - 158.0 ft: uniform drilling resistance, light gray drilling fluid (continued)
158.5 ft: Changes to moist, weak HCl reaction, firm					160	S-51, SPT 4+5+7 REC=18", 100%	
		CL			165	S-52, SPT 5+7+9 REC=17", 94%	163.5 - 165.0 ft: hammer energy test performed
167.0	167.0 - 182.0 ft: LEAN CLAY, moist, brownish gray, no HCl reaction, hard		-75.8		170	S-53, SPT 5+7+8 REC=18", 100%	168.0 - 173.5 ft: uniform drilling resistance, light gray fluid, missed photograph for sample S-53
173.5 ft: Changes to weak HCl reaction		CL			175	S-54, SPT 4+6+8 REC=18", 100%	
					180	S-55, SPT 8+9+12 REC=18", 100%	178.5 - 180.0 ft: hammer energy test performed

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
182.0	182.0 - 196.5 ft: LEAN CLAY, moist, brownish gray, no HCl reaction, firm	CL	-90.8				
					S-56, SPT 7+9+10 REC=18", 100%		
					185		
	188.5 ft: Changes to homogenous structure	CL					
					S-57, SPT 6+8+11 REC=18", 100%		
					190		
		CL					
					S-58, SPT 6+7+10 REC=18", 100%		
					195		
196.5	196.5 - 199.3 ft: SILTY SAND, fine grained sand, moist, brownish gray, weak HCl reaction	SM	-105.3		UD-1, UNDIST REC=10", 104%	PP = 4.50 tsf	196.5 ft: attempted to lower shelly tube for sampling; could not lower shelly tube past 110 ft; switched to 6"OD tricone roller bit and advanced to 195.5 ft, reamed hole to 196.5 ft; shelly tube attempt at 196.3 ft, soil too hard, pushed 10"; 10" recovery, drillers unable to shear soil for shelly tube, sample placed in jar and labeled UD-1
					UD-2, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	199.3 ft: advanced pitcher tube sampler, pushed 24"
199.3	199.3 - 203.0 ft: SILTY SAND, fine grained sand, moist, brownish gray, estimated 5 - 10% shell fragments, contains bands of highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-108.1		S-59, SPT 5+7+18 REC=8", 44%		199.3 ft: switched to 3 1/4" OD tricone roller bit, uniform drilling resistance
203.0	203.0 - 208.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, brownish gray, estimated <5% shell fragments, (highly weathered shell fragments), contains 0.3 inch inclusion of SANDY SILT (SM), moist, orangish brown at 203.5 ft, 1 inch layer of SILTY SAND (SM) between 204.4 and 204.5 ft, brownish gray	SP-SM	-111.8		S-60, SPT 7+17+24 REC=18", 100%		203.5 - 206.5 ft:
		SP-SM			UD-3, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 3.50 tsf PP = 4.50 tsf	
208.5	208.0 - 212.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand,		-117.3				

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
212.5	brownish gray, contains mica, no HCl reaction, contains 2.5 inch layer of SILTY SAND (SM) at 20.8 ft, most, medium sand, brownish gray, contains mica, no HCl reaction	SP-SM	-121.3		210	S-61, SPT 7+12+24 REC=18", 100%	PP = 3.50 tsf PP = 2.50 tsf PP = 3.00 tsf	switched to 6" OD tricone roller bit, reamed hole from 199.5 ft to 203.5 ft
	212.5 - 228.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, brownish gray, no HCl reaction				215	S-62, SPT 5+8+13 REC=18", 100%		206.5 - 208.5 ft: pushed pitcher tube 24", 24" recovery
					220	UD-4, UNDIST REC=24", 100%		208.5 - 213.5 ft: switched to 3 1/4" tricone roller bit and advanced to 213.5 ft (continued)
					225	S-63, SPT 6+13+23 REC=16", 89%		213.5 - 215.0 ft: hammer energy test performed
228.5		SP-SM	-137.3		220	S-64, SPT 5+6+10 REC=16", 89%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	215.5 - 216.5 ft: switched to 6" tricone roller bit and reamed hole from 208.5 to 216.5 ft
					225	UD-5, SPT REC=24", 100%		216.5 ft: pushed pitcher sampler 24", waited 30 minutes, 24" recovery
					230	S-65, SPT 6+9+13 REC=18", 100%		218.5 - 223.5 ft: switched to 3 1/4" tricone roller bit and advanced to 223.5 ft; lost approximately 50 gals of drilling fluid in hole, uniform drilling resistance, gray drilling fluid, contains fine gravel size cuttings
					235	S-66, SPT 7+11+13 REC=18", 100%		223.5 - 225.0 ft: hammer energy test performed
	228.5 - 238.5 ft: SILTY SAND, fine grained sand, moist, brownish gray, contains highly weathered shell layer at 229.6 ft, weak HCl reaction (with shells), no HCl reaction (with soil)	SM						225.5 - 226.5 ft: switched to 6" OD tricone roller bit, reamed hole from 218.5 to 226.5 ft; lost approx 20 gals of drilling fluid
	233.5 ft: Changes to no shells, no HCl reaction							226.5 - 228.5 ft: pushed pitcher sampler 24", 24" recovery
								228.5 - 233.5 ft: switched to 3 1/4" tricone roller bit and advanced to 233.5 ft, uniform drilling resistance; gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
238.5	238.5 - 248.5 ft: SILTY SAND, fine grained sand, moist, brownish gray, contains mica, no HCl reaction	SM	-147.3		UD-6, SPT REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	233.5 - 236.5 ft: switched to 6" OD tricone roller bit; hole reamed from 228.5 to 236.5; uniform drilling resistance (continued)
					S-67, SPT 6+9+15 REC=18", 100%		236.5 - 238.5 ft: pushed pitcher sampler 24"; difficult to push pitcher sampler; almost 600 lbs of pressure used to push sampler; tube fully intact, but exterior scratched from advancement with pitcher sampler
		SM			S-68, SPT 6+9+13 REC=18", 88%		238.5 - 240.0 ft: hammer energy test performed
					UD-7, UNDIST REC=19", 79%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	238.5 - 243.5 ft: switched to 3 1/4" OD tricone roller bit and advanced to 243.5 ft
248.5	248.5 - 251.5 ft: POORLY GRADED SAND WITH CLAY, fine grained sand, moist, brownish gray, no HCl reaction	SP-SC	-157.3		S-69, SPT 6+11+15 REC=14", 78%		246.5 - 248.5 ft: pushed pitcher sampler 24", 19" recovery
251.5			-160.3				250.0 - 251.5 ft: hammer energy test performed

Bottom of Boring at 251.5 ft.



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-355
Schnabel No.: 06120048
Sheet: 1 of 10

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: W. Wolfe

Schnabel Representative: D. Cepull

Equipment: CME-550 (Truck); AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger
3-1/4" O.D. Tri-cone Roller Bit,
6" O.D. Tri-cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/7/08 **Finished:** 7/15/08

Easting: 961175 ft **Northing:** 216925 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 88.2 (ft) **Total Depth:** 250.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/7	9:00 AM	13.5'	18.5'	---
Start of Day	7/9	6:55 AM	15.0'	18.5'	---
Start of Day	7/10	7:00 AM	15.0'	18.5'	---
Start of Day	7/11	7:15 AM	25.0'	18.5'	---
Start of Day	7/14	10:00 AM	30.0'	18.5'	---
Start of Day	7/15	7:00 AM	17.0'	18.5'	---
Completion	7/15	11:07 AM	9.0'	18.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.4	0.0 - 0.4 ft: Topsoil, roots		87.8			S-1, SPT 1+2+3 REC=14", 78%		0.0 ft: advanced 6 1/4" ID hollow stem auger to 18.5 ft; 0.0 to 2.5 ft interval: uniform drilling resistance, light brown silty sand cuttings; changes as noted below, see end of boring log for additional remarks
4.5	0.4 - 4.5 ft: SILTY SAND, fine to coarse grained sand, subrounded particles, moist, orangish brown, contains roots, no HCl reaction, subrounded fine gravel	SM				S-2, SPT 2+4+5 REC=14", 78%		2.5 - 5.0 ft: orangish brown silty sand cuttings
	2.5 ft: Changes to medium to coarse grained sand, no roots							
	4.5 - 17.5 ft: POORLY GRADED SAND WITH SAND, medium to coarse grained sand, subrounded particles, moist, orangish brown, no HCl reaction		83.7		5	S-3, SPT 3+4+3 REC=11", 61%		
	7.5 ft: Changes to subrounded fine gravel, gravel fracture					S-4, SPT 1+4+5 REC=12", 67%		
		SP-SM			10	S-5, SPT 3+5+7 REC=16", 89%		
	13.5 ft: Changes to wet					S-6, SPT 1+7+5 REC=15", 83%		
	15.0 ft: Changes to estimated <5% fine gravel, subrounded fine gravel, gravel fracture				15	S-7, SPT 2+5+5 REC=16", 89%		
17.5	17.5 - 23.0 ft: POORLY GRADED SAND WITH SILT, medium to coarse grained sand, subrounded particles, wet, orangish brown, no HCl reaction	SP-SM	70.7			S-8, SPT 4+12+11 REC=18", 100%		17.5 ft: auger chatter
								18.5 ft: switched to 3 1/2" OD tricone roller bit (mud rotary) and

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
23.0	23.0 - 42.0 ft: LEAN CLAY WITH SAND, fine grained sand, moist, gray, no HCl reaction, soft	SP-SM	65.2		S-9, SPT 3+4+5 REC=18", 100%		advanced to 38.5 ft 18.5 - 23.5 ft: uniform drilling resistance, orangish brown drilling fluid, used Easy Seal as drilling fluid (continued)
					S-10, SPT 2+3+4 REC=18", 100%		28.5 - 33.5 ft: light brown drilling fluid
					S-11, SPT 3+4+7 REC=18", 100%		
	33.5 ft: Changes to firm				S-12, SPT 5+6+9 REC=18", 100%		38.5 - 40.0 ft: switched to 4" OD tricone roller bit to ream hole from 18.5 to 40 ft due to clay buildup; light gray drilling fluid
	38.5 ft: Changes to hard				S-13, SPT 1+6+8 REC=18", 100%		40.0 - 42.5 ft: switched to 3 1/4" OD tricone roller bit and advanced to 188.5 ft; uniform drilling resistance, light gray drilling fluid
	40.0 ft: Changes to soft				S-14, SPT 4+6+7 REC=18", 100%		
42.0	42.0 - 47.0 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, no HCl reaction	SM	46.2		S-15, SPT 5+8+11 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
47.0	47.0 - 49.5 ft: SILTY SAND, fine to medium grained sand, moist, orangish brown, contains mica, no HCl reaction 48.0 ft: Changes to gray	SM	41.2		S-16, SPT 2+13+29 REC=18", 300%		47.5 - 48.0 ft: jar labeled as S-16A 48.0 - 49.0 ft: jar labeled as S-16B 48.0 ft: increased drilling resistance
49.5	49.5 - 64.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, orangish brown, contains mica, no HCl reaction		38.7		50 S-17, SPT 50/5" REC=5", 104%		50.0 - 52.5 ft: uniform drilling resistance
	55.0 ft: Changes to gray, no mica, estimated 5 - 10% shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM			S-18, SPT 16+12+15 REC=12", 67%		
	57.5 ft: Changes to contains shell fragments, no HCl reaction				S-19, SPT 40+50/4" REC=10", 104%		
	60.0 ft: Changes to fine to medium grained sand				S-20, SPT 50/3" REC=3", 83%		
	62.5 ft: Changes to estimated 15 - 25% shell fragments, weak HCl reaction, homogenous structure				S-21, SPT 50/5" REC=5", 104%		
64.5	64.5 - 67.0 ft: SILTY SAND, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, weak HCl reaction, homogenous structure	SM	23.7		65 S-22, SPT 18+25+33 REC=17", 94%		65.5 ft: drilling extremely hard and slow, considerable drilling resistance
67.0	67.0 - 69.0 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, weak HCl reaction, homogenous structure	SM	21.2		S-23, SPT 50/3" REC=3", 83%		67.5 ft: extremely hard and slow drilling
69.0	69.0 - 72.0 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, contains shell fragments, no HCl reaction	SM	19.2		S-24, SPT 10+26+50 REC=18", 100%		
					70 S-25, SPT 50/5" REC=5", 99%		70.0 - 72.5 ft: moderate drilling resistance
72.0	72.0 - 74.5 ft: SILTY SAND, fine to medium grained sand, moist, gray, estimated 5 - 10% shell fragments, homogenous structure, weak HCl reaction (with shells), no HCl reaction	SM	16.2		S-26, SPT 14+12+9 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
74.5	(with soil)	SM	13.7				72.5 - 75.0 ft: moderately uniform drilling resistance, cuttings infrequent (continued)
	74.5 - 77.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, estimated 5 - 10% shell fragments, contains mica, no HCl reaction	SP-SM			75 S-27, SPT 5+4+5 REC=14", 78%		75.0 - 77.5 ft: uniform drilling resistance
77.0	77.0 - 84.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated <5% shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)		11.2		S-28, SPT 5+8+11 REC=12", 67%		
	79.5 ft: Changes to contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM			80 S-29, SPT 5+5+8 REC=18", 100%		
	81.3 ft: Changes to wet						
	82.5 ft: Changes to contains shell fragments, no HCl reaction				S-30, SPT 6+9+9 REC=18", 100%		
84.5	84.5 - 92.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, contains mica, no HCl reaction		3.7		85 S-31, SPT 5+4+5 REC=18", 100%		85.0 - 86.5 ft: uniform drilling resistance
	87.0 ft: Changes to no mica	SP-SM			S-32, SPT 3+4+5 REC=18", 100%		
	90.0 ft: Changes to moist				90 S-33, SPT 3+3+4 REC=18", 100%		
92.0	92.0 - 94.5 ft: SILTY SAND, fine grained sand, moist, gray, estimated 15 - 25% shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-3.8		S-34, SPT 4+5+8 REC=18", 100%		92.5 - 95.0 ft: uniform drilling resistance
94.5	94.5 - 99.2 ft: SILTY SAND, fine to medium grained sand, moist, light gray, estimated 30 - 45% shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-6.3		95 S-35, SPT 12+21+50/5" REC=17", 101%		95.5 - 97.0 ft: hard drilling, considerable drilling resistance
	97.5 ft: Changes to wet, estimated 5 - 10% shell fragments				S-36, SPT 14+42+29 REC=18", 100%		98.0 - 99.2 ft: rod chatter
99.2	99.2 - 104.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, weak HCl reaction (with	SP-SM	-11.0		100 S-37, SPT 18+50/5"		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	shells), no HCl reaction (with soil)					REC=11", 102%		100.0 - 102.5 ft: uniform drilling resistance, light gray drilling fluid (continued)
	102.0 ft: Changes to contains shell fragments, no HCl reaction	SP-SM				S-38, SPT 10+20+29 REC=18", 100%		
104.5	104.5 - 112.5 ft: SILTY SAND, fine grained sand, moist, gray, contains shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)		-16.3		105	S-39, SPT 6+8+11 REC=18", 100%		
	107.5 ft: Changes to estimated 15 - 25% shell fragments	SM				S-40, SPT 6+9+13 REC=18", 100%		113.5 - 118.5 ft: uniform drilling resistance, light gray drilling fluid
					110			
112.5	112.5 - 117.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, contains shell fragments, contains mica, no HCl reaction	SP-SM	-24.3		115	S-41, SPT 4+7+8 REC=18", 100%		
117.5	117.5 - 122.5 ft: SILTY SAND, fine grained sand, moist, gray, contains shell fragments, contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-29.3		120	S-42, SPT 5+7+10 REC=18", 100%		123.5 - 128.5 ft: infrequent cuttings of silty sand
122.5	122.5 - 127.0 ft: SANDY SILT, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, firm, weak HCl reaction (with shells), no HCl reaction (with soil)	ML	-34.3		125	S-43, SPT 7+8+9 REC=18", 100%		
127.0	127.0 - 132.0 ft: SILTY SAND, fine grained sand, moist, gray and white, (continued)	SM	-38.8					

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-355
Schnabel No.: 06120048
Sheet: 6 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
	estimated 30 - 45% shell fragments, white shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM			S-44, SPT 9+19+12 REC=18", 100%		
132.0	132.0 - 137.5 ft: SILTY SAND, fine grained sand, moist, gray, contains shell fragments, contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-43.8		S-45, SPT 5+7+8 REC=18", 100%		133.5 - 135.0 ft: uniform drilling resistance, light gray drilling fluid
137.5	137.5 - 152.5 ft: SANDY SILT, fine grained sand, moist, gray, contains mica, no HCl reaction, firm	ML	-49.3		S-46, SPT 5+6+9 REC=18", 100%		
	148.5 ft: Changes to weak HCl reaction				S-47, SPT 6+6+9 REC=18", 100%		143.5 - 145.0 ft: uniform drilling resistance, light gray drilling fluid
152.5	152.5 - 157.0 ft: SILTY SAND, fine grained sand, moist, gray, no HCl reaction	SM	-64.3		S-48, SPT 4+5+7 REC=18", 100%		
					S-49, SPT 5+5+8 REC=18", 100%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
157.0	157.0 - 182.0 ft: SANDY SILT, fine grained sand, moist, gray, no HCl reaction, firm	SM	-68.8		155		
							158.5 - 160.0 ft: uniform drilling resistance, light gray drilling fluid
					160	S-50, SPT 5+6+9 REC=18", 100%	
					165	S-51, SPT 5+8+10 REC=18", 100%	
					170	S-52, SPT 6+7+8 REC=18", 100%	168.5 - 173.5 ft: uniform drilling resistance, light gray drilling fluid, no solid cuttings
		ML			175	S-53, SPT 6+8+11 REC=18", 100%	
					180	S-54, SPT 4+7+8 REC=16", 89%	178.5 - 180.0 ft: uniform drilling resistance, light gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
182.0	182.0 - 191.0 ft: SANDY SILT, fine grained sand, moist, brownish gray, weak HCl reaction, firm	ML	-93.8		S-55, SPT 5+7+12 REC=18", 100%		183.5 - 188.5 ft: uniform drilling resistance, light gray drilling fluid, no solid cuttings
					S-56, SPT 6+6+9 REC=18", 100%		188.5 ft: switched to 6" OD tricone roller bit and reamed hole from 188.5 to 191.5 ft
191.0	191.0 - 197.5 ft: SILTY SAND, fine grained sand, moist, grayish brown, weak HCl reaction	SM	-102.8		UD-1, UNDIST REC=23", 96%	PP = 4.00 tsf PP = 3.50 tsf PP = 4.50 tsf	191.5 - 193.5 ft: pitcher sampler pushed 24"; 23" recovery
					S-57, SPT 6+10+12 REC=18", 100%		193.5 - 198.5 ft: switched to 3 1/4" OD tricone roller bit and advanced to 198.5; uniform drilling resistance, light gray drilling fluid, no solid cuttings
197.5	197.5 - 201.0 ft: SILTY SAND, fine grained sand, moist, grayish brown, estimated <5% shell fragments, contains mica, weak HCl reaction, highly weathered shell fragments	SM	-109.3		S-58, SPT 12+20+24 REC=9", 50%		198.5 ft: switched to 6" OD tricone roller bit to 201.5 ft
201.0	201.0 - 218.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, contains mica, no HCl reaction	SP-SM	-112.8		UD-2, UNDIST REC=23", 96%	PP = 4.50 tsf PP = 4.50 tsf PP = 3.00 tsf	201.5 - 203.5 ft: pushed pitcher sampler 24"; 23" recovery
					S-59, SPT 4+5+20 REC=16", 89%		203.5 ft: switched to 3 1/4" OD tricone roller bit and advanced to 248.5 ft 203.5 - 208.5 ft: uniform drilling resistance, light gray drilling fluid, small gravel sized sand cuttings

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
					210	S-60, SPT 4+5+10 REC=18", 100%	208.5 - 213.5 ft: no gravel sized sand cuttings (continued)
	213.5 ft: Changes to fine grained sand, brownish gray	SP-SM			215	S-61, SPT 4+5+10 REC=15", 83%	
218.0	218.0 - 224.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, contains mica	SP-SM	-129.8		220	S-62, SPT 5+7+12 REC=18", 100%	
224.0	224.0 - 227.5 ft: SILTY SAND, fine grained sand, moist, grayish brown, contains mica, no HCl reaction	SM	-135.8		225	S-63, SPT 6+14+24 REC=16", 89%	223.5 - 225.0 ft: added 1/2 bag of bentonite to drilling fluid, borehole caved at 30 and 193 ft following casing removal
227.5	227.5 - 232.5 ft: SILTY SAND, fine grained sand, moist, brownish gray, contains mica, weak HCl reaction, homogenous structure	SM	-139.3		230	S-64, SPT 5+8+15 REC=18", 100%	225.0 - 228.5 ft: uniform drilling resistance, light gray drilling fluid; added 1/2 bag of bentonite to support sides of borehole
232.5	232.5 - 242.5 ft: SANDY SILT, fine grained sand, moist, brownish gray, contains mica, no HCl reaction, hard, homogenous structure	ML	-144.3		235	S-65, SPT 4+10+20 REC=14", 78%	233.5 - 238.5 ft: gray drilling fluid

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-355**
Schnabel No.: 06120048
Sheet: 10 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
								233.5 - 238.5 ft: gray drilling fluid (continued)
	238.5 ft: Changes to firm	ML			240	S-66, SPT 5+8+13 REC=18", 100%		
242.5	242.5 - 247.5 ft: SANDY SILT, fine grained sand, moist, brownish gray, contains mica, no HCl reaction, homogenous structure	ML	-154.3		245	S-67, SPT 5+12+26 REC=14", 78%		
247.5	247.5 - 250.0 ft: SANDY SILT, fine grained sand, moist, brownish gray, contains mica, no HCl reaction, homogenous structure	ML	-159.3			S-68, SPT 4+7+11 REC=13", 72%		
250.0			-161.8		250			
Bottom of Boring at 250.0 ft. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.								



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-356
Schnabel No.: 06120048
Sheet: 1 of 10

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Connelly

Schnabel Representative: P. Patrick/K. Bell

Equipment: CME-75 (Truck); AWJ/NWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-cone Roller Bit,
6" O.D. Tri-cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/8/08 **Finished:** 7/16/08

Easting: 961260 ft **Northing:** 216964 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 120± (ft) **Total Depth:** 250.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/8	---	23.5'	18.5'	---
Start of Day	7/9	7:10 AM	6.0'	18.5'	---
Start of Day	7/11	---	18.4'	18.5'	---
Start of Day	7/14	8:00 AM	43.5'	18.5'	---
Start of Day	7/15	7:00 AM	17.0'	18.5'	---
Completion	7/16	7:00 AM	13.0'	18.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.5	0.0 - 0.5 ft: FILL, sampled as poorly graded gravel with silt and sand, fine to coarse grained sand, moist, dark gray, no HCl reaction, subrounded to subangular gravel, flat and elongated from 0 to 0.5 ft	FILL	119.5			S-1, SPT 4+3+6 REC=18", 100%		0.0 ft: advanced 61/4" ID HSA to 18.5 ft; 0.0 - 2.5 interval: slight chatter to 0.5 ft (possible gravel)
2.5	0.5 - 2.5 ft: FILL, sampled as clayey sand, fine to medium grained sand, moist, orangish brown, estimated <5% roots, estimated <5% fine gravel, no HCl reaction	FILL	117.5			S-2, SPT 3+3+3 REC=10", 56%		2.5 ft: uniform drilling resistance, changes as noted below, see end of boring log for additional remarks
6.0	2.5 - 6.0 ft: PROBABLE FILL, sampled as clayey sand, fine to coarse grained sand, moist, brown and orangish brown, no HCl reaction, contains 0.2 inch layer of sandy clay, moist, gray at 2.6 ft	FILL	114.0		5	S-3, SPT 2+2+2 REC=13", 72%		5.0 ft: soft drilling
7.0	6.0 - 7.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, yellowish brown, no HCl reaction, color changes to yellowish brown at 5.4 ft	SP-SM	113.0			S-4, SPT 3+2+3 REC=10", 56%		7.5 ft: easy drilling
10.6	7.0 - 10.6 ft: CLAYEY SAND, fine to medium grained sand, moist, orangish brown, contains mica, no HCl reaction	SC			10	S-5, SPT 4+7+9 REC=18", 100%		10.0 - 10.6 ft: jar labeled as S-5A
12.5	10.6 - 12.5 ft: SANDY LEAN CLAY, fine grained sand, moist, gray and orangish brown, no HCl reaction, soft to very soft	CL	109.4					10.0 ft: soft drilling
17.0	12.5 - 17.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, orangish brown and gray, contains mica, no HCl reaction, contains a 2.5 inch layer of sandy lean clay, moist, gray and speckled orange at 14.5 ft	SP-SM	107.5		15	S-6, SPT 11+8+16 REC=18", 100%		10.6 - 11.5 ft: jar labeled as S-5B
	17.0 - 22.0 ft: POORLY GRADED SAND, fine to coarse grained sand, subangular particles, moist, gray and orangish brown, estimated <5% silt, no HCl reaction	SP	103.0			S-7, SPT 20+19+22 REC=18", 100%		13.5 - 15.0 ft: hammer energy test performed 13.5 ft: harder drilling 14.0 ft: cuttings change to yellowish brown

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
22.0	22.0 - 27.0 ft: POORLY GRADED SAND, fine to coarse grained sand, subrounded to subangular particles, wet, yellowish brown and reddish brown, no HCl reaction, contains 0.4 inch layer of silty sand, wet, reddish brown at 24.0 ft; coarse sand from 24.0 to 24.0 ft	SP	98.0					drilling) and advanced to 221.5 ft; uniform drilling 19.5 ft: yellowish brown drilling fluid
		SP			25	S-8, SPT 11+8+12 REC=18", 100%		24.5 ft: reddish brown drilling fluid
27.0	27.0 - 32.0 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, rounded to subrounded particles, wet, yellowish brown and orangish brown, no HCl reaction	SP-SM	93.0					28.5 ft: orangish brown drilling fluid 29.5 ft: slight rig chatter (possible gravel)
		SP			30	S-9, SPT 7+8+10 REC=10", 56%		
32.0	32.0 - 37.0 ft: POORLY GRADED SAND, fine to coarse grained sand, subrounded to subangular particles, wet, yellowish brown, estimated <5% silt, no HCl reaction	SP	88.0					33.5 - 43.5 ft: drillers thickened drilling fluid
		SP			35	S-10, SPT 16+17+18 REC=12", 67%		
37.0	37.0 - 42.0 ft: CLAYEY SAND, fine to medium grained sand, wet, orangish brown and gray, no HCl reaction	SC	83.0					
		SC			40	S-11, SPT 2+4+6 REC=14", 78%		
42.0	42.0 - 47.0 ft: SILTY SAND, fine to medium grained sand, wet, reddish brown and orangish brown, no HCl reaction, contains a 0.2 inch lean clay with sand layer at 44.5 ft, moist, gray	SM	78.0					43.5 - 45.0 ft: hammer energy test performed
		SM			45	S-12, SPT 2+2+3 REC=17", 94%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
47.0	47.0 - 57.0 ft: SANDY LEAN CLAY, fine grained sand, wet, dark gray, contains mica, no HCl reaction, very soft to soft, homogenous structure	CL	73.0				
	53.5 ft: Changes to soft						
57.0	57.0 - 70.5 ft: LEAN CLAY, moist, gray, estimated <5% fine grained sand, contains mica, no HCl reaction, soft to firm, homogenous structure	CL	63.0				
	63.5 ft: Changes to firm						
	68.5 ft: Changes to hard						
70.5	70.5 - 73.0 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, contains mica, no HCl reaction, hard, homogenous structure, contains 0.5 inch layer of SILTY SAND (SM), fine sand, moist, dark gray at 71.5 ft	CL	49.5				
73.0	73.0 - 75.5 ft: SANDY LEAN CLAY, fine to medium grained sand, gray and	CL	47.0				

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DRAFT

48.5 ft: gray
drilling fluid,
softer drilling

58.5 ft: slightly
harder drilling
58.5 - 60.5 ft:
dropped rods in
hole, unable to
sample, drill
down 2 ft to get
next sample,
easy drilling
60.5 - 62.0 ft:
hammer energy
test performed
60.5 ft: easy
drilling

S-13, SPT
3+4+4
REC=18", 100%

S-14, SPT
2+3+2
REC=21", 117%

S-15, SPT
3+3+5
REC=18", 100%

S-16, SPT
3+5+5
REC=18", 100%

S-17, SPT
3+5+7
REC=18", 100%

S-18, SPT
3+5+6
REC=18", 100%

S-19, SPT

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
75.5	greenish gray, no HCl reaction, soft to very soft, homogenous structure	CL	44.5		75	4+5+5 REC=18", 100%		73.5 - 75.0 ft: hammer energy test performed (continued)
77.5	75.5 - 77.5 ft: SANDY LEAN CLAY, fine to medium grained sand, gray, no HCl reaction, hard, homogenous structure	CL	42.5			S-20, SPT 11+14+26 REC=13", 72%		
80.0	77.5 - 80.0 ft: SILTY SAND, fine grained sand, wet, orangish brown and yellowish brown, estimated <5% shell fragments, fresh shell fragments, contain 1.5 inch layer of sandy lean clay, fine sand, moist, gray at 79.0 ft, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	40.0		80	S-21, SPT 17+20+50/5" REC=15", 88%		77.5 ft: harder drilling (possible shells)
	80.0 - 90.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, brown and yellowish brown, no HCl reaction, homogenous structure					S-22, SPT 50/4" REC=4", 83%		80.0 ft: rig chatter (possible shells)
	83.5 ft: Changes to yellowish brown					S-23, SPT 50/6" REC=6", 100%		81.5 ft: heavy rig chatter (possible cemented sand) 82.5 ft: softer drilling
	86.0 ft: Changes to gray and light gray	SP-SM			85	S-24, SPT 50/4" REC=4", 83%		83.5 - 85.0 ft: hard drilling
	88.5 ft: Changes to gray					S-25, SPT 50/4" REC=3", 62%		
90.0	90.0 - 93.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, no HCl reaction, homogenous structure	SP-SM	30.0		90	S-26, SPT 15+11+33 REC=13", 72%		86.0 - 88.5 ft: harder drilling
93.0	93.0 - 98.0 ft: SANDY LEAN CLAY, fine grained sand, wet, estimated <5% shell fragments, firm to soft, homogenous structure, weak HCl reaction (with shells and soil)	CL	27.0			S-27, SPT 3+50/3" REC=12", 125%		88.5 - 88.9 ft: hammer energy test performed 88.5 ft: hard drilling
	96.0 ft: Changes to firm, contains 0.5 ft strongly cemented layer at 96.0 ft, shells increase with depth					S-28, SPT 21+13+46 REC=18", 100%		93.0 ft: Schnabel representative changed to P. Patrick
98.0	98.0 - 100.5 ft: CLAYEY SAND, fine grained sand, wet, gray, estimated <5% shell fragments, fresh shell fragments, weak HCl reaction (with shells and soil)	SC	22.0		95	S-29, SPT 4+8+8 REC=19", 106%		93.4 ft: slight rig chatter (possible cemented sands) 93.5 ft: very hard drilling (possible shells) 96.0 ft: hard drilling (possible shells)
100.5	100.5 - 101.5 ft: SANDY LEAN CLAY, (continued)	CL	19.5		100			

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
101.5	fine grained sand, wet, gray and light gray, estimated <5% shell fragments, soft to firm, homogenous structure, weak HCl reaction (with shells and soil) 101.0 - 113.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated <5% shell fragments, weak HCl reaction, homogenous structure, fresh shell fragments	CL	18.5			S-30, SPT 50/4" REC=3", 83%		100.5 ft: hard drilling (possible shells)
					105	S-31, SPT 6+9+11 REC=16", 89%		103.5 - 105.0 ft: hammer energy test performed
	106.0 ft: Changes to moderately weathered shell fragments, weak HCl reaction with shells, shell content increases with depth	SP-SM				S-32, SPT 6+11+16 REC=17", 94%		
					110	S-33, SPT 6+7+8 REC=18", 100%		
	111.0 ft: Changes to fresh shell fragments					S-34, SPT 6+8+12 REC=16", 89%		
113.0	113.0 - 122.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray and dark gray, estimated <5% shell fragments, weak HCl reaction, homogenous structure, moderately weathered shell fragments 115.5 ft: Changes to highly weathered shell fragments 118.0 ft: Changes to gray	SP-SM	7.0			S-35, SPT 6+11+13 REC=18", 100%		
					115	S-36, SPT 4+6+9 REC=16", 89%		
					120	S-37, SPT 3+3+4 REC=18", 100%		
122.0	121.0 ft: Changes to fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil), shells increase with depth 122.0 - 124.0 ft: SANDY FAT CLAY, fine grained sand, wet, gray, estimated <5% shell fragments, weak HCl reaction, soft to firm, fresh shell fragments	CH	-2.0			S-38, SPT 4+4+4 REC=18", 100%		
124.0	124.0 - 125.5 ft: CLAYEY SAND, fine grained sand, wet, gray, estimated 15 - 25% shell fragments, fresh to moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SC	-4.0			S-39, SPT 3+4+8 REC=17", 94%		123.5 - 124.0 ft: jar labeled as S-39A
125.5	125.5 - 128.0 ft: SANDY LEAN CLAY, fine grained sand, wet, gray, estimated	CL	-5.5		125	S-40, SPT 12+19+26 REC=18", 100%		124.0 - 125.0 ft: jar labeled as S-39B

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
128.0	5 - 10% shell fragments, weak HCl reaction, firm to soft, homogenous structure, moderately to highly weathered shell fragments, amount of shells increased with depth	CL	-8.0					
129.2		SC	-9.2					
130.5	128.0 - 129.2 ft: SANDY LEAN CLAY, fine grained sand, wet, gray, estimated <5% shell fragments, weak HCl reaction, firm, moderately weathered shell fragments	SP-SM	-10.5		130	S-41, SPT 12+16+25 REC=18", 100%		128.5 - 129.2 ft: jar labeled as S-41A
133.0	129.2 - 130.5 ft: CLAYEY SAND, fine grained sand, wet, gray, estimated <5% shell fragments, strong HCl reaction	SP	-13.0					129.2 - 130.0 ft: jar labeled as S-41B
135.5	130.5 - 133.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated <5% shell fragments, weak HCl reaction, homogenous structure, moderately weathered shell fragments, shells increase with depth	SM	-15.5		135	S-42, SPT 16+27+32 REC=16", 89%		131.0 - 136.0 ft: rig chatter (possible shell fragments)
138.0	133.0 - 135.5 ft: POORLY GRADED SAND WITH SAND, fine grained sand, wet, gray, estimated <5% shell fragments, weak HCl reaction, homogenous structure, moderately weathered shell fragments	CL	-18.0					
139.2	135.5 - 138.0 ft: SILTY SAND, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, fresh shells, strong HCl reaction (with shells), moderate HCl reaction (with soil), shells increase with depth	SM	-19.2			S-43, SPT 5+8+13 REC=18", 100%		
140.0	138.0 - 139.2 ft: SANDY LEAN CLAY, fine grained sand	SP-SM	-20.0		140	S-44, SPT 4+5+10 REC=18", 100%		138.5 - 139.2 ft: jar labeled as S-45A
147.0	139.2 - 140.0 ft: SILTY SAND, fine grained sand, wet, gray, estimated 15 - 25% shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)							139.2 - 140.0 ft: jar labeled as S-45B
	140.0 - 147.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated <5% shell fragments, weak HCl reaction, homogenous structure, highly weathered shell fragments				145	S-45, SPT 3+5+11 REC=18", 100%		
	147.0 - 157.0 ft: CLAYEY SAND, fine grained sand, wet, gray, estimated <5% shell fragments, weak HCl reaction, highly weathered shell fragments, running sands from 149.8 - 150 ft	SC	-27.0					
					150	S-46, SPT 5+6+8 REC=18", 100%		148.5 - 150.0 ft: hammer energy test performed
	153.5 ft: Changes to homogenous structure, fresh to moderately weathered shell fragments, strong HCl							153.5 - 158.5 ft: mixed new batch of drilling fluid
						S-47, SPT 6+6+8 REC=17", 94%		
						S-48, SPT 5+6+7 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	reaction (with shells), weak HCl reaction (with soil)	SC			155		153.5 - 158.5 ft: mixed new batch of drilling fluid (continued)
157.0	157.0 - 162.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, homogenous structure, fresh pink and white shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-37.0		S-49, SPT 6+11+23 REC=14", 78%		
162.0	162.0 - 167.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated <5% shell fragments, homogenous structure, fresh pink and white shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP	-42.0		S-50, SPT 4+5+7 REC=18", 100%		163.5 - 165.0 ft: hammer energy test performed
167.0	167.0 - 182.0 ft: SANDY SILT, fine grained sand, wet, gray, estimated <5% shell fragments, homogenous structure, fresh shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)		-47.0		S-51, SPT 4+6+9 REC=18", 100%		168.5 - 173.5 ft: easy (soft) drilling
		ML			170		
	175.5 ft: Changes to dark gray, estimated <5% shell fragments, weak HCl reaction, firm, moderately weathered shell fragments				S-52, SPT 3+6+7 REC=16", 67%		173.5 ft: attempted to take sample but dropped sample (sample penetrated 18 inches); drilled 2 ft past top of previous sample to take another sample
	178.5 ft: Changes to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)				S-53, SPT 6+3+8 REC=18", 100%		178.5 - 180.0 ft: hammer energy test performed
					180		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
182.0	182.0 - 187.0 ft: SANDY ELASTIC SILT, fine grained sand, wet, dark brownish gray, estimated <5% shell fragments, weak HCl reaction, firm, homogenous structure, highly weathered shell fragments	MH	-62.0					
187.0	187.0 - 192.0 ft: LEAN CLAY WITH SAND, fine grained sand, wet, brownish gray, weak HCl reaction, firm, homogenous structure, sand increases with depth	CL	-67.0					
192.0	192.0 - 197.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, greenish gray, weak HCl reaction, sand increases with depth	SP-SM	-72.0					
197.0	197.0 - 202.0 ft: CLAYEY SAND, fine grained sand, wet, gray, no HCl reaction, homogenous structure	SC	-77.0					
202.0	202.0 - 207.0 ft: SILTY SAND, fine grained sand, wet, gray, strong HCl reaction, homogenous structure, fines increase with depth	SM	-82.0					
207.0	207.0 - 223.0 ft: SANDY SILT, fine grained sand, wet, brownish gray, weak HCl reaction, firm, homogenous structure	ML	-87.0					

(continued)

193.5 - 195.0 ft:
hammer energy
test performed

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
					210	S-59, SPT 5+6+8 REC=18", 100%		208.5 ft: easy drilling 208.5 - 210.0 ft: hammer energy test performed (continued)
					215	S-60, SPT 5+6+9 REC=18", 100%		
					220	S-61, SPT 6+7+10 REC=18", 100%		
						UD-1, UNDIST REC=13", 68%		
223.0	223.0 - 228.0 ft: SILT, moist, olive and greenish gray, estimated <5% fine grained sand, weak HCl reaction, hard, homogenous structure		-103.0			UD-2, UNDIST REC=18", 75%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	221.5 - 222.6 ft: pushed Shelby tube, 13 inches, poor recovery, (labeled jar as UD-1)
	225.0 ft: Changes to estimated <5% fine grained sand, estimated <5% shell fragments, weak HCl reaction, fine sand size highly weathered shell fragments	ML			225	S-62, SPT 5+8+9 REC=18", 100%		221.5 ft: Schnabel representative changed to K. Bell
228.0	228.0 - 231.0 ft: SILTY SAND, fine to medium grained sand, wet, gray and light gray, estimated 5 - 10% shell fragments, fine to medium sand size highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-108.0		230	S-63, SPT 7+9+12 REC=14", 78%		221.5 ft: Driller switched to 6" OD tricone roller bit and advanced to 221.5 ft; 223.0 ft: driller added clean water to drilling fluid, driller washed and reamed while advancing (every 2.0 ft), uniform resistance, greenish gray and brownish gray, drilling fluid, NWJ rods used during drilling
231.0	231.0 - 237.0 ft: SILTY SAND, fine to medium grained sand, wet, gray, estimated <5% shell fragments, fine to coarse sand size fresh to moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-111.0			UD-3, UNDIST REC=24", 100%	PP = 2.50 tsf PP = 2.00 tsf PP = 3.00 tsf PP = 2.00 tsf PP = 2.50 tsf	225.0 - 226.5 ft: hammer energy test performed
					235	S-64, SPT 7+14+16 REC=18", 100%		225.1 ft: switched to 3 1/2" OD tricone roller bit and advanced to 231.5 ft; uniform

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-356
Schnabel No.: 06120048
Sheet: 10 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
237.0		SM	-117.0					resistance; hard drilling, greenish gray drilling fluid
	237.0 - 241.0 ft: SILTY SAND, fine grained sand, wet, olive, estimated <5% shell fragments, weak HCl reaction, homogenous structure, fine sand sized highly weathered shell fragments	SM				S-65, SPT 4+6+9 REC=18", 100%		231.5 - 241.5 ft: advanced 6" OD tricone roller bit; driller added clean water to mud tub, uniform resistance, smooth drilling, greenish gray and olive gray drilling fluid, driller used NWJ rods while drilling (continued)
	239.5 ft: Changes to olive and gray				240			238.5 - 240.0 ft: hammer energy test performed
241.0	241.0 - 250.0 ft: SILTY SAND, fine grained sand, moist, greenish gray and olive gray, estimated <5% shell fragments, weak HCl reaction, fine sand size, highly weathered shell fragments		-121.0			UD-4, UNDIST REC=24", 100%		241.5 - 248.5 ft: switched to 3 1/2" tricone roller bit and advanced to 250.0 ft; driller used AWJ rods for drilling, uniform drilling, greenish gray drilling fluid
		SM			245	S-66, SPT 5+7+10 REC=17", 94%		
	248.5 ft: Changes to fine sand size, moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)					S-67, SPT 4+5+6 REC=18", 100%		248.5 - 250.0 ft: performed hammer energy test
250.0			-130.0		250			

Bottom of Boring at 250.0 ft.
Pulled augers and grouted boring.
Boring terminated at selected depth (250 ft)
Boring backfilled per procedures

**TEST
BORING
LOG****Project:** CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257**Boring Number:** **B-357A**
Schnabel No.: 06120048
Sheet: 1 of 10**Contractor:** Connelly and Associates, Inc.
Frederick, Maryland**Contractor Foreman:** T. Chew**Schnabel Representative:** P. Patrick/K. Bell**Equipment:** CME-75 (Truck); AWJ Rods**Method:** 6-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-cone Roller Bit,
3-3/4" O.D. Tri-cone Roller Bit/4-3/4" O.D. Tri-cone**Hammer Type:** Auto Hammer (140 lb)**Dates** **Started:** 7/24/08 **Finished:** 8/25/08**Easting:** 961168 ft **Northing:** 216931 ft**Coordinate System:** MD State Plane**Ground Surface Elevation:** 105± (ft) **Total Depth:** 250.0 ft**Groundwater Observations**

	Date	Time	Depth	Casing	Caved
Start of Day	7/25	7:00 AM	Dry	9.5'	---
Start of Day	7/28	8:00 AM	35.0'	9.5'	---
Start of Day	7/29	7:00 AM	4.5'	99.0'	---
Start of Day	7/30	---	7.0'	99.0'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	0.0 - 107.5 ft: see B-357 for lithologic description							0.0 ft: advanced 6-1/4 ID HSA to 9.5 ft; see end of boring log for additional remarks
					5			
					10			9.5 ft: switched to 3-3/4" OD tricone roller bit (mud rotary) and advanced to 61.7 ft, driller mixed 2 bags of bentonite with 150 gallons of water (drilling fluid); see end of boring log for additional remarks
					15			

(continued)

Boring Number:	B-357A
Schnabel No.:	06120048
Sheet:	2 of 10

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(continued)



**TEST
BORING
LOG**

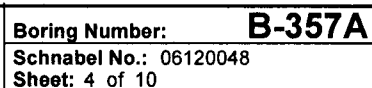
Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-357A
Schnabel No.: 06120048
Sheet: 3 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
					50			
					55			
					60			
					65			
					70			
								61.5 ft: lost drilling fluid in augers, driller mixed thick drilling fluid and pumped ~ 100 gallons from the hole with no return; driller attempted to pump drilling fluid (rods were clogged with fluid and had to be broken down) 61.7 ft: driller tried to advance 3-3/4 OD tricone roller bit (using drilling fluid left sitting overnight), drilling fluid soaked off at 61.5 ft but once driller advanced past the seal, lost ~ 50 gallons drilling fluid

DRAFT

(continued)



(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
								98.5 - 106.0 ft: smooth drilling, gray drilling fluid (continued)
107.5	107.5 - 111.0 ft: SILTY SAND, fine grained sand, wet, greenish gray, estimated 5 - 10% shells, homogenous structure, strong cementation, moderate to highly weathered shells, weak HCl reaction (with shells), strong HCl reaction (with soil); contains hair like object, possibly organic in nature	SM	-2.5			S-1, SPT 6+7+10 REC=18", 100%		107.5 ft: rig chatter
111.0	111.0 - 115.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray and olive, estimated 5 - 10% shells, homogenous structure, weak cementation, moderately weathered shells, strong HCl reaction (with shells), weak HCl reaction (with soil); shells increase with depth	SP-SM	-6.0			S-2, SPT 50/5" REC=7", 39%		109.0 - 111.0 ft: hard drilling
115.5	115.5 - 120.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated 5 - 10%, homogenous structure, fresh shells, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-10.5			S-3, SPT 11+15+33 REC=18", 100%		111.0 - 113.5 ft: moderate drilling resistance
120.5	120.5 - 123.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, olive gray, estimated 5 - 10% shells, homogenous structure, fresh shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-15.5			S-4, SPT 12+16+30 REC=18", 100%		113.5 - 116.0 ft: slight rig chatter
123.0	123.0 - 127.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, brownish gray, estimated <5% shell fragments, homogenous structure, moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-18.0			S-5, SPT 8+8+16 REC=18", 100%		116.0 - 118.5 ft: smooth drilling
127.5	127.5 - 137.0 ft: SILTY SAND, fine	SM	-22.5			S-6, SPT 5+5+10 REC=18", 100%		118.5 - 121.0 ft: fine grained sand and fine shell fragments in cuttings; marsh funnel test performed on drilling fluid = 67 sec drilling fluid
						S-7, SPT 6+7+21 REC=18", 100%		123.5 - 125.0 ft: last sample of continuous sampling
						S-8, SPT 5+6+9 REC=18", 100%		123.5 - 128.5 ft: silt and fine shell fragments in cuttings

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	grained sand, wet, dark gray, estimated <5% shells, weak HCl reaction, highly weathered shells	SM			130	S-9, SPT 6+9+11 REC=18", 100%		128.5 - 133.5 ft: smooth drilling
	133.5 ft: Changes to fresh shells, weak HCl reaction (with shells), no HCl reaction (with soil)				135	S-10, SPT 4+6+8 REC=18", 100%		133.5 - 138.5 ft: light gray drilling fluid, fine grained sand in cuttings
137.0	137.0 - 142.0 ft: SILTY SAND, fine grained sand, wet, olive gray, estimated 5 - 10% shell fragments, no HCl reaction, homogenous structure, moderately weathered shell fragments	SM	-32.0		140	S-11, SPT 4+4+6 REC=18", 100%		138.5 - 143.5 ft: fast and easy drilling, gray drilling fluid
142.0	142.0 - 147.5 ft: SILTY SAND, fine grained sand, wet, brownish gray, estimated 5 - 10% shell fragments, homogenous structure, fresh shells, weak HCl reaction (with shells), strong HCl reaction (with soil), shells decrease and then increase with depth	SM	-37.0		145	S-12, SPT 4+7+4 REC=18", 100%		143.5 - 148.5 ft: easy drilling, fine shells and silt in cuttings
147.5	147.5 - 157.0 ft: SANDY SILT, fine grained sand, wet, olive gray, estimated <5% shells, weak HCl reaction, hard, homogenous structure, moderately weathered shells	ML	-42.5		150	S-13, SPT 4+8+8 REC=18", 100%		148.5 - 153.5 ft: moderately hard drilling, silt, fine sands and fine shell fragments in cuttings
	153.0 ft: Changes to estimated <5% shell fragments, highly weathered shell fragments, no HCl reaction (with shells), weak HCl reaction (with soil)					S-14, SPT 5+7+9 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
157.0	157.0 - 167.0 ft: SANDY SILT, fine grained sand, wet, brownish gray, estimated <5% shell fragments, firm, homogenous structure, fresh to moderately weathered shell fragments, no HCl reaction (with shells), weak HCl reaction (with soil)	ML	-52.0		S-15, SPT 4+5+7 REC=17", 94%		158.5 - 163.5 ft: fine sand, fine shell fragments and silt clumps in cuttings
167.0	167.0 - 177.0 ft: SANDY ELASTIC SILT, fine grained sand, wet, brownish gray, estimated <5% shell fragments, no HCl reaction, hard, homogenous structure	ML	-62.0		S-16, SPT 5+7+7 REC=0", 0%		163.5 - 165.0 ft: no recovery possibly due to insufficient suction in spoon to pull soil up 165.0 ft: drillers cleaned out tub and added 1/2 of a bag of bentonite to 150 gallons clean water
173.5	Changes to olive gray, weak HCl reaction, firm	MH			S-17, SPT 5+6+9 REC=16", 89%		171.0 ft: slower drilling
177.0	177.0 - 181.0 ft: SILTY SAND, fine grained sand, wet, gray, estimated <5% shell fragments, weak HCl reaction, homogenous structure	SM	-72.0		S-18, SPT 5+7+9 REC=18", 100%		
181.0	181.0 - 187.5 ft: SANDY SILT, fine grained sand, wet, olive gray,	ML	-76.0		S-19, SPT 4+7+9		181.0 ft: harder drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	estimated <5% shell fragments, weak HCl reaction, firm, homogenous structure	ML			185	S-20, SPT 4+7+8 REC=18", 100%		183.5 - 188.5 ft: hard drilling
187.5	187.5 - 192.5 ft: SANDY ELASTIC SILT, fine grained sand, wet, olive gray, estimated <5% shell fragments, weak HCl reaction, hard to firm, homogenous structure, soil softens from hard to firm with depth	MH	-82.5		190	S-21, SPT 6+9+12 REC=18", 100%		
192.5	192.5 - 207.0 ft: CLAYEY SAND, (fine) grained sand, wet, olive gray, estimated <5% mica, no HCl reaction, homogenous structure		-87.5		195	S-22, SPT 6+8+9 REC=18", 100%		193.5 - 198.5 ft: uniform drilling
	198.5 ft: Changes to brownish gray, weak HCl reaction	SC			200	S-23, SPT 6+8+11 REC=4", 22%		198.5 - 203.5 ft: fine sand and fine sand size shell fragments in cuttings
	203.5 ft: Changes to olive gray, estimated <5% shells, no mica, no HCl reaction, homogenous structure				205	S-24, SPT 5+8+10 REC=18", 100%		203.5 - 208.5 ft: fine sand and fine shell fragments in cuttings
207.0	207.0 - 212.5 ft: SILTY SAND, fine grained sand, wet, brownish gray, estimated 5 - 10% shell fragments, weak HCl reaction, homogenous	SM	-102.0					207.0 ft: easier drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	structure, moderately weathered shell fragments, shells increase with depth	SM			210	S-25, SPT 4+5+12 REC=18", 100%		208.5 - 213.5 ft: uniform drilling resistance (continued)
212.5	212.5 - 214.6 ft: SILTY SAND, fine grained sand, wet, olive gray, estimated <5% shell fragments	SM	-107.5					
214.6	214.6 - 217.5 ft: SANDY SILT, fine grained sand, wet, olive gray, estimated <5% shell fragments, weak HCl reaction, very soft, homogenous structure	ML	-109.6		215	S-26, SPT 7+14+15 REC=18", 100%		213.5 - 214.6 ft: jar labeled as S-26A 213.5 - 218.5 ft: easier drilling 214.6 - 215.0 ft: jar labeled as S-26B
217.5	217.5 - 222.0 ft: SILTY SAND, fine grained sand, wet, olive gray, weak HCl reaction, homogenous structure, fine fraction is possibly elastic silt; has some cohesion	SM	-112.5		220	S-27, SPT 4+6+12 REC=18", 100%		218.5 - 223.5 ft: silt clumps, fine sand and fine shell fragments in cuttings, driller added water to tub 218.5 - 220.0 ft: performed Hammer Energy Test
222.0	222.0 - 227.5 ft: SILTY SAND, fine grained sand, wet, olive gray, estimated <5% shell fragments, no HCl reaction, homogenous structure, highly weathered shell fragments	SM	-117.0		225	S-28, SPT 5+7+11		223.5 - 228.5 ft: easy drilling
227.5	227.5 - 232.0 ft: SILTY SAND, fine grained sand, wet, olive gray, weak HCl reaction, homogenous structure	SM	-122.5		230	S-29, SPT 5+7+10 REC=18", 100%		
232.0	232.0 - 242.5 ft: SILTY SAND, fine grained sand, wet, brownish gray, estimated <5% shell fragments, homogenous structure, fresh to moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-127.0		235	S-30, SPT 5+7+8 REC=18", 100%		

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-357A
Schnabel No.: 06120048
Sheet: 10 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
237.0	Changes to olive gray, no HCl reaction	SM						233.5 - 238.5 ft: increase in drilling fluid, density relative to drilling earlier in day, possibly associated with an increase in silt in drilling fluid (continued)
242.5	242.5 - 250.0 ft: SANDY ELASTIC SILT, fine grained sand, wet, olive gray, weak HCl reaction, firm, homogenous structure	MH	-137.5		240	S-31, SPT 4+10+11 REC=18", 100%		
					245	S-32, SPT 6+8+10 REC=18", 100%		243.5 - 248.5 ft: drillers flushed drilling fluid out of hole using water in preparation of grouting boring cavity following last sampling interval
250.0	247.0 ft: Changes to estimated <5% shell fragments, no HCl reaction, highly weathered shell fragments		-145.0		250	S-33, SPT 6+8+12 REC=18", 100%		

Bottom of Boring at 250.0 ft.

NOTE: Please refer to original field log for end of day groundwater observation depths

Boring backfilled by means of tremie pipe with cement/bentonite grout up to a depth of 100 ft. While pulling casing, base of rig pulled off of truck bed.

Additional Remarks

8.5 - 98.5 ft: advanced 5" OD casing using 140 lbs auto hammer. At 25 ft inside the casing, driller began to advance 4 3/4" OD tricone roller bit (to clean out the plug they got while driving the casing); the roller bit got clogged at 30.5 ft with clay; driller cleaned off the bit and continued cleaning the casing to a depth of 63.5 ft, lost mud/drilling fluid at 63.5 ft. Continued to advance 5" OD casing to 64 ft. Driller cleaned out casing using 4 3/4" OD tricone roller bit to a depth of 73.35 ft, lost drilling fluid at 73.5 ft (~ 50 gallons), driller advanced 5" OD casing to a depth of 74 ft.

74 - 79 ft: Driller emptied 150 gallons of mud tub and filled the tub with 150 gallons of clean water. While lowering 4 3/4" OD tricone roller bit, bit got clogged with clay, driller cleaned bit and rods. Driller advanced 4 3/4" OD tricone roller bit to a depth of 78.5 ft, advanced 5" OD casing to a depth of 79 ft. Schnabel personnel switched from K. Bell to P. Patrick.

79 - 85 ft: Driller advanced 3 3/4" OD tricone roller bit to a depth of 83.5 ft. Driller advanced 5" OD casing to a depth of 84 ft. Driller advanced 4 3/4" OD tricone roller bit to a depth of 88.5 ft. Grinding at 85 ft (smooth drilling).

85 - 93.5 ft: Driller advanced 5" OD casing to a depth of 89 ft. Driller introduced clean water into hole via hose connected to water tank in order to more clearly see if mud is being lost. Driller advanced 4 3/4" OD tricone roller bit to a depth of 93.5 ft. Lost water in hole. Driller added one bag of bentonite into tub, drilling mud is gray. Driller added an additional bag of bentonite to 150 gal tub.

93.5 ft: Driller advanced 5" OD casing to a depth of 94 ft. Drillers advanced 4 3/4" OD tricone roller bit to a depth of 98.5. Marsh funnel test performed on mud = 58 sec drilling fluid. Drillers advanced 5" OD casing to a depth of 99 ft. Changed drill bit from 4 3/4" OD tricone roller bit to 3 1/2" OD tricone roller bit.



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-357**
Schnabel No.: 06120048
Sheet: 1 of 5

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: M. Lark

Schnabel Representative: W. Bradfield

Equipment: CME-75 (Truck); AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-cone Roller Bit,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 6/24/08 Finished: 7/8/08

Easting: 961176.1 ft Northing: 216925.8 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 105± (ft) Total Depth: 105.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Start of Day	6/25	6:55 AM	8.6'	13.5'	---
Start of Day	6/27	8:12 AM	65.2'	78.5'	---
Start of Day	7/1	7:11 AM	3.6'	79.0'	---
Start of Day	7/3	8:00 AM	22.8'	79.0'	---
Start of Day	7/8	7:11 AM	55.1'	79.0'	---
Completion	7/8	5:46 PM	Na	---	30.2'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.7	0.0 - 0.7 ft: Asphalt, brick fragments, roots		104.0			S-1, SPT 1+2+3 REC=21", 117%		0.0 ft: Advanced 6 1/4 HSA to 15.0 ft, smooth, uniform drilling, orangish brown cuttings; changes as noted below, see end of boring for additional remarks
2.0	0.7 - 2.0 ft: PROBABLE FILL, sampled as silty sand, fine to medium grained sand, moist, yellowish brown, estimated 5 - 10% roots, no HCl reaction, homogenous structure		102.7			S-2, SPT 1+2+5 REC=12", 67%		0.0 - 0.7 ft: Jar labeled as S-1A
	2.0 - 23.0 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, subrounded to subangular particles, moist, orangish brown with bands of light yellowish brown, no HCl reaction, stratified, 1/2" to 1" alternating color layers				5	S-3, SPT 1+5+6 REC=16", 89%		0.7 - 1.5 ft: Jar labeled as S-1B
	5.0 ft: Changes to light yellowish brown with bands of orangish brown, 1" to 3" of alternating color					S-4, SPT 2+2+2 REC=13", 72%		6.5 - 11.5 ft: light yellowish brown cuttings
	7.5 ft: Changes to subangular to rounded particles, light orangish brown, homogenous structure				10	S-5, SPT 2+4+7 REC=14", 78%		
	10.0 ft: Changes to light yellowish brown and light brown, 1/8" layer of LEAN CLAY (CL), moist, light gray at 11.4 ft					S-6, SPT 3+6+9 REC=12", 67%		11.5 - 13.5 ft: light orangish brown cuttings
	13.5 ft: Changes to subrounded to subangular particles, light yellowish brown and light orangish brown, contains 1/8" layer of LEAN CLAY (CL), moist, light gray at 14.6 ft				15	S-7, SPT 4+5+11 REC=9", 50%		13.5 - 15.0 ft: SPT Hammer Energy Test performed
	18.5 ft: Changes to subangular to rounded particles, light brown and light yellowish brown, estimated <5% fine gravel, stratified, rounded fine gravel,							15.0 ft: Driller switched from 6 1/4 ID auger to 3 1/2 OD tricone roller bit (mud rotary) and advanced to 105.0 ft smooth, uniform drilling, light brownish gray drilling fluid
								18.5 ft: Approx 30 gal of drilling

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04 22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	contains 0.5 inch layer of SILTY SAND (SM), moist, orangish brown at 19.7 ft, 1/4" to 1" layer of alternating color	SP-SM					fluid lost due to lean mud mix thickened drilling fluid
23.0	23.0 - 28.5 ft: CLAYEY SAND, fine to medium grained sand, wet, orangish brown with mottles of light gray, no HCl reaction	SC	81.7		S-8, SPT 1+1+2 REC=16", 89%		23.0 ft: dark brown drilling fluid
28.5	28.5 - 32.0 ft: SILTY SAND, fine grained sand, dark gray, contains mica, no HCl reaction, homogenous structure	SM	76.2		S-9, SPT 3+1+2 REC=16", 89%		25.5 - 26.0 ft: slightly harder drilling (possible gravel layer), light brown drilling fluid
32.0	32.0 - 37.0 ft: CLAYEY SAND, fine grained sand, wet, dark gray, contains mica, no HCl reaction	SC	72.7		S-10, SPT 1+1+3 REC=17", 94%		28.5 - 30.0 ft: Hammer Energy Test performed
37.0	37.0 - 47.0 ft: LEAN CLAY WITH SAND, moist, dark gray, contains mica, no HCl reaction, soft, homogenous structure	CL	67.7		S-11, SPT 3+3+4 REC=18", 100%		30.0 ft: Thickened mud to remove gravel slough, light grayish brown drilling fluid
					S-12, SPT 3+6+6 REC=18", 100%		35.0 ft: gray drilling fluid
							43.5 - 45.0 ft: Hammer Energy test performed

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-357
Schnabel No.: 06120048
Sheet: 3 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
47.0	47.0 - 49.0 ft: SANDY LEAN CLAY, fine grained sand, moist, gray with bands of dark gray, estimated <5% organics, contains mica, no HCl reaction, firm, organics are plant matter	CL	57.7					
49.0	49.0 - 49.3 ft: CLAYEY SAND, fine grained sand, wet, dark gray, contains mica, no HCl reaction	SC	55.7					
49.3	49.3 - 55.5 ft: LEAN CLAY WITH SAND, fine grained sand, moist, gray, contains mica, no HCl reaction, firm	CL	55.4		50	S-13, SPT 4+5+6 REC=18", 100%		48.5 - 49.0 ft: Jar labeled as S-13A 49.0 - 49.3 ft: Jar labeled as S-13B 49.3 - 50.0 ft: Jar labeled as S-13C 50.0 ft: slightly harder resistance
55.5	55.5 - 58.0 ft: SILTY SAND, fine to medium grained sand, moist, dark gray, contains mica, no HCl reaction	SM	49.2		55	S-14, SPT 5+8+10 REC=18", 100%		53.5 ft: Hole blocked by clay plug @ ~ 20 ft, driller added clay inhibitor fluid to break down clay, gray drilling fluid with some clay cuttings 55.0 ft: Began continuous sampling from El +50 to -20
58.0	58.0 - 62.1 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, moist, dark gray, estimated <5% cemented sands, no HCl reaction, weak cementation, coarse sand cumble	SP-SM	46.7		60	S-15, SPT 5+6+7 REC=18", 100%		58.5 - 60.0 ft: Hammer Energy Test performed
62.1	61.0 ft: Changes to subangular particles, with bands of dark orangish brown, estimated 5 - 10% cemented sands, estimated <5% shell fragments, no HCl reaction, moderate cementation, highly weathered shell fragments, shell fragments are dark orangish brown	SM	42.6			S-16, SPT 6+13+22 REC=18", 100%		61.0 - 62.1 ft: Jar labeled as S-17A
63.4	62.1 - 63.4 ft: SILTY SAND, fine to coarse grained sand, angular to subrounded particles, moist, dark brown with bands of yellowish brown, estimated 15 - 25% cemented sands, moderate cementation, strong HCl reaction with yellowish brown layers, no HCl reaction (with shells or soil), shell imprints are highly oxidized, no HCl reaction	SP-SM	41.3		65	S-17, SPT 12+32+21 REC=12", 67%		62.1 - 62.5 ft: Jar labeled as S-17B 62.1 ft: Harder drilling due to cemented sands
65.5	63.4 - 65.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, light yellowish brown with mottles of dark reddish brown, no HCl reaction	SP	39.2			S-18, SPT 9+12+15		
70.5	65.5 - 70.5 ft: POORLY GRADED SAND, fine to medium grained sand, wet, light brown, estimated <5% silt, no HCl reaction, homogenous structure	SP	34.2		70	S-19, SPT 23+26+25 REC=17", 94%		66.0 ft: light gray drilling fluid
73.0	68.5 ft: Changes to fine grained sand	SP				S-20, SPT 21+20+3 REC=15", 83%		
	70.5 - 73.0 ft: POORLY GRADED SAND, fine grained sand, wet, gray, estimated <5% silt, contains mica, no HCl reaction, homogenous structure	SP-SM	31.7			S-21, SPT 14+9+7 REC=11", 61%		
						S-22, SPT		73.0 ft: Faster drilling rate at 73

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
74.2	73.0 - 74.2 ft: POORLY GRADED SAND WITH SILT AND GRAVEL, fine to medium grained sand, wet, gray and brown, no HCl reaction, gravel as cemented sands, rounded gravel, no HCl reaction in cemented sands	SM	30.5		75	2+4+8 REC=18", 100%		ft (very soft material)
75.5	74.2 - 75.5 ft: SILTY SAND, fine to coarse grained sand, subrounded to subangular particles, wet, light gray and light brownish white, estimated 50 - 100% shell fragments, estimated <5% organics, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	29.2			S-23, SPT 7+11+11 REC=6", 33%		73.5 ft: Lost drilling fluid through auger casing @ 73.5 ft (~ 100 gals)
78.0	75.5 - 78.0 ft: SILTY SAND, fine to medium grained sand, moist, gray and brownish white, estimated 30 - 45% shell fragments, weak cementation, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	26.7			S-24, SPT 50/1" REC=1", 83%		73.5 - 75.0 ft: Hammer Energy Test performed (continued)
80.9	78.0 - 80.9 ft: SILTY SAND, fine to medium grained sand, moist, gray, estimated 50 - 100% cemented sands, estimated 5 - 10% shell fragments, strong HCl reaction (with cemented sands), strong HCl reaction (with shells)	SM	23.8		80	S-25, SPT 13+24+54/1" REC=13", 98%		73.5 - 74.2 ft: Jar labeled as S-22A (continued)
85.2	80.0 ft: Changes to fine to coarse grained sand, rounded particles, estimated 5 - 10% cemented sands, estimated <5% shell fragments, strong HCl reaction (with shells), strong HCl reaction (with cemented sands), weak HCl reaction (with soil), weak to moderate cementation, coarse sand probably due to cemented sand	SM	19.5			S-26, SPT 50/2.5" REC=2.5", 104%		74.2 - 75.0 ft: Jar labeled as S-22B
	80.9 - 85.2 ft: SILTY SAND WITH GRAVEL, fine to coarse grained sand, rounded particles, moist, gray, estimated <5% shell fragments, subangular to angular fine gravel, strong HCl (with shells), strong HCl (with cemented sands), weak HCl (with soil), moderate to strong cementation, coarse sand to fine gravel crumble, coarse sand and fine gravel as cemented sands	SP-SM			85	S-27, SPT 12+12+11 REC=18", 100%		79.0 ft: rig chatter, hard drilling, slow advancement
	83.5 ft: Changes to angular to subrounded particles, light brownish gray, estimated 15 - 25% shell fragments, weak to moderate cementation, coarse sand and fine gravel consist as shell fragments and cemented sands					S-28, SPT 7+11+22 REC=17", 94%		80.0 - 80.9 ft: Jar labeled as S-25A
	85.2 - 95.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray with streaks of brownish white, estimated 5 - 10% shell fragments, fresh to highly weathered shell fragments, strong HCl (with shells), no HCl reaction (with soil), shell fragments are brownish white	SM	9.2		90	S-29, SPT 8+6+7 REC=17", 94%		80.9 - 81.1 ft: Jar labeled as S-25B
95.5						S-30, SPT 5+9+10 REC=17", 94%		82.1 ft: easier drilling
98.0	90.5 ft: Changes to fine to coarse grained sand, light gray with speckles of brownish white, estimated 30 - 45% shell fragments	SM	6.7			S-31, SPT 8+12+16 REC=18", 100%		83.2 ft: gray drilling fluid w/ silt cuttings, harder drilling, slow advancement
100.5	93.5 ft: Changes to fine to medium grained sand, gray with speckles of brownish white, estimated 15 - 25%	SM	4.2		100	S-32, SPT 7+10+12 REC=18", 100%		85.2 ft: rig chatter, easier drilling
		SP-SM						88.5 - 90.0 ft: Hammer Energy Test performed

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-357
Schnabel No.: 06120048
Sheet: 5 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
105.0	<p>shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)</p> <p>95.5 - 98.0 ft: SILTY SAND, fine to medium grained sand, wet, gray, estimated <5% shell fragments, medium sand sized fresh shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)</p> <p>98.0 - 100.5 ft: SILTY SAND, fine to coarse grained sand, rounded to subrounded particles, wet, brownish gray, estimated 5 - 10% shell fragments, coarse sand size fresh to highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil), contains "hair-like" features, possibly organic in nature</p> <p>100.5 - 105.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, contains mica, highly weathered shell fragments, no HCl reaction (with shells and soil)</p> <p>103.5 ft: Changes to moderate to highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with highly weathered shells), no HCl reaction (with soil)</p>	SP-SM	-0.3		105	<p>S-33, SPT 3+4+8 REC=18", 100%</p> <p>S-34, SPT 3+3+3 REC=18", 100%</p>		101.0 - 103.5 ft: Hammer Energy Test performed
<p>Bottom of Boring at 105.0 ft. Terminated boring due to lack of return and grout/bentonite mud take as requested NOTE: Negative groundwater depth denotes water level above ground surface (i.e. "negative depth"), but does not necessarily imply artesian conditions</p> <p>Additional Remarks 75 ft: Tape advanced to 69 ft but difficult to tell mud elevation due to clay in boring and use of mud, caving heard from ground level, driller thickened mud to attempt closing off mud loss zone, pumped in additional ~ 340 gal of thick mud without return (total mud taken ~ 440 gals); allowed mud to sit overnight, added more drilling fluid next morning and advanced HSA casing to seal off mud loss zone 75.5 ft: Additional 100 gal of very thick grout without return, only raised depth of mud from 62.5 ft bgs to 58 ft bgs, advanced 6 1/4" ID auger to 76 ft; reamed out hole 79.0: Added ~ 300 gal of bentonite mud to borehole; only raised depth of mud from 65.2 to 60 ft (no return); augers were advanced from 40 to 79 ft to clean out borehole. Reamed out augers with 3 1/2 OD tricone and bentonite mud; achieved return from top of augers after pumping in 50 gal of mud 105 ft: 40 ft of rods slipped through ring and into borehole, unable to retrieve; numerous attempts made to retrieve 40 ft of rods in borehole with a variety of methods; rods retrieved successfully During reaming of borehole after retrieving rods, ~ 50 gal of mud lost (mud at 62 ft bgs), added 10 lbs of plugz-it to 50 gal of mud and pumped into borehole, no mud return, 2nd attempt using ~15 lbs of plugz-it to 50 gal of mud, pumped in without return, called plugz-it supplier; recommended adding as much plugz-it to mud as pumpable and allow to hydrate overnight; 3rd attempt using 30 lbs plugz-it to 50 gal of mud. Please refer to original field log for End of Day groundwater observation depths</p>								



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-771**
Schnabel No.: 06120048
Sheet: 1 of 5

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-cone Roller Bit,
6" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/24/08 Finished: 7/28/08

Easting: 960931.9 ft Northing: 219268.2 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 10.6 (ft) Total Depth: 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/24	9:02 AM	7.5'	7.5'	---
Start of Day	7/25	7:30 AM	5.5'	14.5'	---
Start of Day	7/28	8:20 AM	8.0'	14.5'	---
Completion	7/28	11:24 AM	2.7'	14.5'	100.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.0 - 2.0	FILL, sampled as sandy lean clay with gravel, fine to medium grained sand, moist, brown, estimated 15 - 25% crushed stone, no HCl reaction	FILL	8.6			S-1, SPT 3+4+7 REC=11", 61%		0.0 ft: Advanced 6 1/4" ID HSA to 14.5 ft. At 0.0 to 2.5 ft interval: rig chatter from 0.3 to 2.0 ft, brown cuttings.
2.0 - 4.5	FILL, sampled as poorly graded sand, medium to coarse grained sand, subangular particles, moist, orangish red and orangish brown, contains a 2 inch layer of silty sand, fine sand, moist, dark gray, est < 5% coarse sand size fresh shell fragments at 3.8 ft, strong HCl reaction (with shells), no HCl reaction (with soil)	FILL	6.1		5	S-2, SPT 1+6+7 REC=11", 61%		Changes as noted below. See end of boring log for additional remarks
4.5 - 7.0	FILL, sampled as silty sand, medium grained sand, subangular particles, moist, orangish brown, estimated <5% crushed stone, no HCl reaction, lensed, 1 inch pockets of lean clay, light gray, moist	FILL	3.6			S-3, SPT 5+7+7 REC=17", 94%		3.0 - 3.3 ft: Rig chatter
7.0 - 8.8	SILTY SAND, medium grained sand, rounded particles, wet, orangish brown with bands of light gray, no HCl reaction	SM	1.8			S-4, SPT 1/12+1" REC=9", 50%		5.0 - 7.5 ft: Uniform drilling resistance, smooth drilling
8.8 - 9.5	SANDY LEAN CLAY, medium grained sand, rounded particles, wet, light gray, no HCl reaction, soft	CL	1.1		10	S-5, SPT 1/12+2" REC=5", 28%		7.5 - 10.0 ft: light brown cuttings
9.5 - 12.5	SILTY SAND, medium to coarse grained sand, rounded particles, wet, orangish brown and light gray, no HCl reaction	SM	-1.9					7.5 - 8.8 ft: Jar labeled as S-4A
12.5 - 17.5	POORLY GRADED SAND WITH SILT, fine to medium grained sand, rounded particles, wet, gray, estimated 15 - 25% shell fragments, coarse sand to fine gravel size fresh to moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM			15	S-6, SPT 4+4+2 REC=14", 78%		8.8 - 9.0 ft: Jar labeled as S-4B
17.5 - 22.0	POORLY GRADED SAND, fine to medium grained sand, subrounded particles, wet, dark gray, estimated <5% shell fragments, coarse sand to fine gravel size fresh to highly weathered shell fragments, weak HCl	SP	-6.9			S-7, SPT 4+4+7 REC=15", 83%		14.5 ft: Switch to 3 1/2" OD tricone roller bit (mud rotary) and advanced to 23.5 ft, mix one bag of bentonite with 125 gallons of water to make drilling fluid

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
22.0	reaction (with shells), no HCl reaction (with soil)	SP	-11.4				fluid.
22.0 - 27.0 ft:	POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM			S-8, SPT 3+9+12 REC=18", 100%		23.5 - 28.5 ft: switched to 6" OD tricone bit and reamed to 28.5 ft, greenish gray fluid during reaming
27.0	27.0 - 31.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated 5 - 10% fine gravel, estimated 5 - 10% shell fragments, fine gravel as cemented sands, coarse sand to fine gravel size fresh to highly weathered shell fragments, strong HCl reaction (with shells and soil), moderate to strong cementation	SM	-16.4		S-9, SPT 6+32+50 REC=18", 100%		28.5 ft: Advanced 6"OD tricone bit to 100 ft. 28.5 to 33.5 ft interval difficult drilling from 29 ft 30.5 ft, olive gray fluid, thinned fluid by adding water
31.0	31.0 - 37.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction	SM	-20.4		UD-1, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	31.5 - 33.5 ft: pushed pitcher sampler: 24", 24" recovery
37.0	37.0 - 41.0 ft: SILT, moist, olive gray, contains mica, estimated <5% shell fragments, firm, coarse sand size highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	ML	-26.4		S-10, SPT 3+6+11 REC=18", 100%		33.5 - 38.5 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid
41.0	41.0 - 43.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction	SM	-30.4		S-11, SPT 6+9+9 REC=18", 100%		
43.5	43.5 - 47.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand size moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-32.9		UD-2, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	41.5 - 43.5 ft: pushed pitcher sampler: 24", 24" recovery
					S-12, SPT 5+7+11 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
47.0	47.0 - 51.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated 5 - 10% shell fragments, coarse sand to fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-36.4					
51.5	51.5 - 53.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, contains shell fragments, weak HCl reaction, highly weathered shell fragments	SP-SM	-40.9			UD-3, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	51.5 - 53.5 ft: pushed pitcher sampler: 24", 24" recovery
53.5	53.5 - 57.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand size highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-42.9			S-14, SPT 5+7+10 REC=18", 100%		
57.0	57.0 - 61.0 ft: SILT, moist, olive gray, contains mica, strong HCl reaction, firm	ML	-46.4			S-15, SPT 8+8+11 REC=18", 100%		58.5 - 61.5 ft: thinned drilling fluid by adding water
61.0	61.0 - 67.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, contains shell fragments, weak HCl reaction, coarse sand size, highly weathered shell fragments 63.5 ft: Changes to estimated <5% shell fragments, coarse sand size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-50.4			UD-4, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	61.5 ft: flushed boring to remove settled cuttings 61.5 - 63.5 ft: pushed pitcher sampler: 24", 24" recovery
67.0	67.0 - 81.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm	ML	-56.4			S-17, SPT 5+7+9 REC=18", 100%		68.5 - 71.5 ft: thinned drilling fluid by adding water
						UD-5, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	71.5 - 73.5 ft: pushed pitcher sampler: 24", 24" recovery
						S-18, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
75					7+9+11 REC=18", 100%		
80					S-19, SPT 8+8+11 REC=18", 100%		
81.0	81.0 - 91.0 ft: SILT, moist, olive gray, contains mica, weak HCl reaction, firm	ML	-70.4		UD-6, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	81.5 - 83.5 ft: pushed pitcher sampler: 24", 24" recovery
85		ML			S-20, SPT 9+10+11 REC=18", 100%		
90					S-21, SPT 7+9+11 REC=18", 100%		
91.0	91.0 - 100.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm	ML	-80.4		UD-7, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	91.5 - 93.5 ft: pushed pitcher sampler: 24", 24" recovery
95					S-22, SPT 8+10+12 REC=18", 100%		
100.0		ML	-89.4		S-23, SPT 9+10+12 REC=18", 100%		

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-771**
Schnabel No.: 06120048
Sheet: 5 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	Bottom of Boring at 100.0 ft. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.							
	<u>Additional Remarks</u> 71.5 - 78.5 ft: Cuttings contain silt and coarse sand sized shell fragments 78.5 - 81.5 ft: Cuttings contain coarse sand sized shell fragments, thinned drilling fluid by adding water and removing cuttings from mud tub, pumped out all fluid in mud tub, mixed one bag of bentonite with 125 gallons of water to make new mud, circulated mud through boring to clear cuttings Please refer to original field log for End of Day groundwater observation depths							

DRAFT



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-772
Schnabel No.: 06120048
Sheet: 1 of 5

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: T. Chew
Schnabel Representative: B. Glass
Equipment: Diedrich D-50 (Track ATV); AWJ Rods
Method: 6-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-cone Roller Bit,
6" O.D. Tri-cone Roller Bit
Hammer Type: Auto Hammer (140 lb)
Dates Started: 7/29/08 **Finished:** 7/30/08
Easting: 960876.1 ft **Northing:** 219323.9 ft **By:** Land Survey
Coordinate System: MD State Plane
Ground Surface Elevation: 10.6 (ft) **Total Depth:** 100.0 ft

Groundwater Observations					
	Date	Time	Depth	Casing	Caved
Encountered	7/29	8:38 AM	7.5'	7.5'	---
Start of Day	7/30	8:00 AM	4.0'	24.0'	---
Completion	7/30	10:00 AM	3.2'	24.0'	53.7'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.2	0.0 - 0.2 ft: Topsoil, organics, grass	FILL	10.4			S-1, SPT 2+4+5 REC=12", 67%		0.0 ft: Advanced 6 1/4" ID HSA to to 9.0 ft. at 0.0 to 2.5 ft interval bit chatter/auger grinding from 0.0 to 5 ft, brown cuttings, changes as noted below, see end of boring log for additional remarks.
2.0	0.2 - 2.0 ft: FILL, sampled as sandy lean clay, fine to medium grained sand, subangular particles, moist, brown, estimated 5 - 10% crushed stone, no HCl reaction		8.6			S-2, SPT 5+14+19 REC=15", 83%		2.5 ft: Uniform drilling resistance, smooth drilling
	2.0 - 7.0 ft: FILL, sampled as silty sand, medium to coarse grained sand, subangular particles, moist, orangish brown, estimated <5% fine gravel, estimated <5% crushed stone, no HCl reaction				5	S-3, SPT 4+8+7 REC=15", 83%		
7.0	7.0 - 12.5 ft: SILTY SAND, medium to coarse grained sand, subangular particles, wet, orangish brown, no HCl reaction, contains a 2 inch layer of SANDY LEAN CLAY (CL), medium sand, moist brown at 8.1 ft	SM	3.6			S-4, SPT woh+1+1 REC=16", 89%		7.5 - 9.0 ft: orangish brown cuttings
	10.0 ft: Changes to medium grained sand, subrounded particles, estimated <5% fine gravel				10	S-5, SPT 1+2+1 REC=11", 61%		9.0 ft: switched to 3 1/2" OD tricone roller bit (mud rotary) and advanced to 38.5 ft, mixed one bag of bentonite with 125 gallons of water for drilling fluid
12.5	12.5 - 17.0 ft: SILTY SAND, medium grained sand, wet, gray, estimated 5 - 10% fine gravel, estimated <5% shell fragments, strong HCl reaction, moderate cementation, coarse sand to fine gravel size moderately to highly weathered shell fragments, fine gravel as cemented sand	SM	-1.9			S-6, SPT 9+10+11 REC=18", 100%		9.0 ft: uniform drilling resistance, smooth drilling, brown drilling fluid
					15			13.5 - 18.5 ft: brownish gray fluid
17.0	17.0 - 22.5 ft: POORLY GRADED SAND, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, coarse sand to fine gravel size, highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP	-6.4			S-7, SPT 2+6+9 REC=11", 61%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04 22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
22.5	22.5 - 27.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, estimated <5% fine gravel, estimated <5% shell fragments, strong HCl reaction, fine gravel as cemented sands, fine gravel size highly weathered shell fragments, weak to moderate cementation	SP	-11.9					18.5 - 23.5 ft: drilling fluid cuttings contain coarse sand sized cemented sands (continued)
		SP-SM			25	S-8, SPT 8+10+16		
27.0	27.0 - 32.5 ft: SILTY SAND, fine grained sand, moist, dark gray, estimated <5% fine gravel, estimated <5% shell fragments, strong HCl reaction, fine gravel as cemented sands, coarse sand to fine gravel sized fresh to highly weathered shell fragments, moderate to strong cementation	SM	-16.4					28.5 - 33.5 ft: Uniform drilling, smooth drilling despite high blow counts, drilling fluid cuttings contain coarse sand sized cemented sands and coarse sand size fresh shell fragments
		SP-SM			30	S-9, SPT 25+50/3" REC=8", 83%		
32.5	32.5 - 37.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, no HCl reaction	SP-SM	-21.9					33.5 - 38.5 ft: olive gray fluid, drilling fluid cuttings contain coarse sized fresh shell fragments
		SP-SM			35	S-10, SPT 4+6+8 REC=18", 100%		
37.0	37.0 - 41.5 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm	ML	-26.4					38.5 ft: switched to 6" O.D. tricone roller bit and advanced to 58.5 ft, reamed hole
		ML			40	S-11, SPT 7+8+9 REC=18", 100%		
41.5	41.5 - 43.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, no HCl reaction	SM	-30.9				PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	41.5 - 43.5 ft: pushed pitcher sampler 24", 24 recovery
		SM			45	UD-1, UNDIST REC=24", 100%		41.5 ft: Advanced 6" OD tricone bit: uniform drilling resistance, smooth drilling, olive gray drilling fluid
43.5	43.5 - 56.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size moderately weathered shell fragment, strong HCl reaction (with shells), weak HCl reaction (with soil), contains 0.25 inch of organics (wood) at 44.4 ft	SM	-32.9					
		SM				S-12, SPT 4+8+11 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
48.5	Changes to estimated 5 - 10% shell fragments, fresh to moderately weathered shell fragments					S-13, SPT 7+8+12 REC=18", 100%		48.5 ft: removed cuttings from mud tub, added 75 gallons of water and half a bag of bentonite to make drilling fluid
51.5	Changes to estimated <5% shell fragments, moderately weathered shell fragments, strong HCl reaction (with shells and soil)	SM				UD-2, UNDIST REC=13.5", 56%		51.5 - 53.5 ft: pushed pitcher sampler 24", 13.5" recovery, sample placed in jar and labeled as UD-2
53.5	Changes to estimated 5 - 10% shell fragments, contains a 1.5 inch layer of POORLY GRADED SAND (SP) fine to medium sand at 52.6 ft, coarse sand to fine gravel size fresh to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)					S-14, SPT 4+8+12 REC=18", 100%		
56.0	56.0 - 58.5 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm	ML	-45.4			UD-3, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	56.5 - 58.5 ft: pushed pitcher sampler 24", 24" recovery
58.5	58.5 - 62.5 ft: SILT WITH SAND, fine grained sand, moist, olive gray, contains mica, strong HCl reaction, firm	ML	-47.9			S-15, SPT 9+10+11 REC=18", 100%		56.5 ft: switched to 3-1/2" OD tricone roller bit and advanced to 100 ft, 56.6 to 63.5 interval, uniform drilling resistance, smooth drilling, olive gray drilling fluid
62.5	62.5 - 67.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-51.9			S-16, SPT 6+7+11 REC=18", 100%		
67.5	67.5 - 77.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction	SM	-56.9			S-17, SPT 8+10+12 REC=18", 100%		68.5 - 70.0 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid
						S-18, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
		SM			5+6+8 REC=18", 100%		73.5 ft: Circulate drilling fluid to remove cuttings that settled overnight
77.0	77.0 - 87.0 ft: SILT, moist, olive gray, contains mica, strong HCl reaction, firm		-66.4		S-19, SPT 7+8+9 REC=18", 100%		
	83.5 ft: Changes to weak HCl reaction	ML			S-20, SPT 9+10+14 REC=18", 100%		83.5 - 85.0 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid
87.0	87.0 - 100.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm		-76.4		S-21, SPT 7+8+9 REC=18", 100%		
		ML			S-22, SPT 8+10+11 REC=18", 100%		93.5 - 98.5 ft: thinned drilling fluid by adding water
	98.5 ft: Changes to strong HCl reaction				S-23, SPT 9+10+12 REC=18", 100%		
100.0			-89.4				

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-772**
Schnabel No.: 06120048
Sheet: 5 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		

Bottom of Boring at 100.0 ft.

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

NOTE: Negative groundwater depth denotes water level above ground surface (i.e. "negative depth"), but does not necessarily imply artesian conditions.

Additional Remarks

41.5 ft: Attempt to lower pitcher sampler, but rods got hung up at about 11.0 ft, attempt to clear augers with 6" OD tricone bit with no success, advanced 6 1/4" ID HSA to 24 ft to case off the zone where the pitcher sampler was getting hung up, thinned drilling fluid by adding water, reamed boring with 6" OD tricone bit to 41.5 ft Please refer to original field log for End of Day groundwater observation depths.

DRAFT



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-773A
Schnabel No.: 06120048
Sheet: 1 of 6

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Connelly

Schnabel Representative: K. Bell

Equipment: CME-75 (Truck); AWJ

Method: 6-1/4" I.D. Hollow Stem Auger,
6" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 8/7/08 **Finished:** 8/12/08

Easting: 961053 ft **Northing:** 219234 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 8± (ft) **Total Depth:** 150.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
End of Day	8/7	6:15 PM	1.0'	8.5'	---
Start of Day	8/8	7:00 AM	2.0'	8.5'	---
End of Day	8/8	1:45 PM	1.5'	8.5'	---
Start of Day	8/11	9:00 AM	6.0'	8.5'	30.0'
End of Day	8/11	5:15 PM	1.5'	8.5'	---
Start of Day	8/12	7:30 AM	10.0'	8.5'	---
Completion	8/12	2:30 PM	6.0'	8.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
0.0 - 18.0 ft	POORLY GRADED GRAVEL WITH SAND, fine to coarse gravel, angular to subangular particles, wet, light gray, contains shells, hard, fine to coarse sand, subrounded to subangular coarse sand, strong cementation with gravel, strong HCl reaction (with soil)	GP						0.0 ft: see boring log B-773 for accurate lithologic divisions, complete intermediate descriptions and additional remarks; lithologic divisions shown here may not reflect actual boundaries
13.0 - 15.0 ft						UD-1, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	13.0 - 15.0 ft: pushed pitcher sample 24", 24" recovery 13.0 ft: advanced 6" OD tricone roller bit to 150 ft
18.0 - 28.0 ft	SILTY SAND, fine to medium grained sand, moist, olive gray, contains shells, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-10.1					

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-773A
Schnabel No.: 06120048
Sheet: 2 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
								13.0 - 23.0 ft: rig chatter from 13 to 18 ft (possible cemented sands), smooth drilling from 18 to 19 ft, rig chatter and hard drilling from 19 to 20 ft (possible cemented sand), smooth drilling from 20 to 23 ft; changes as noted below (continued)
		SM			25	UD-2, UNDIST REC=15.5", 65%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	
28.0	28.0 - 37.0 ft: SANDY SILT, fine grained sand, moist, olive gray and grayish green, contains shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)		-20.1		30			23.0 - 25.0 ft: pushed pitcher sample 24", 15.5" recovery 23.0 - 33.0 ft: uniform drilling resistance, smooth drilling harder drilling at 26.5 ft, slight rig chatter at 28 ft (possible shells), smooth drilling 25 ft to 33 ft, light gray drilling fluid
		ML			35	UD-3, UNDIST REC=19", 79%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	33.0 - 35.0 ft: pushed pitcher sample 24", 19" recovery 33.0 - 43.0 ft: uniform drilling resistance, smooth drilling, light gray drilling fluid
37.0	37.0 - 72.0 ft: SILTY SAND, fine to medium grained sand, moist, olive gray, contains shell fragments, weak HCl reaction		-29.1		40			
		SM			45	UD-4, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	43.0 - 45.0 ft: pushed pitcher sample 24", 24" recovery

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-773A**
Schnabel No.: 06120048
Sheet: 3 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
					50			43.0 - 53.0 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid, cuttings observed are clumps of silty sand, fine to medium sand (continued)
					55	UD-5, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	53.0 - 55.0 ft: pushed pitcher sample 24", 24" recovery 53.0 - 63.0 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid, cuttings observed are clumps of silty sand, fine to medium sand and shells
		SM			60			
	63.0 ft: Changes to dark olive gray, strong HCl reaction				65	UD-6, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	63.0 - 65.0 ft: pushed pitcher sample 24", 24" recovery 63.0 - 73.0 ft: cuttings observed are silty sand, fine to medium sand
					70			
72.0	72.0 - 92.0 ft: SANDY ELASTIC SILT, fine grained sand, moist, grayish green, contains mica, weak HCl reaction	MH	-64.1			UD-7, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf	

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04 22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
75							PP > 4.50 tsf	73.0 - 75.0 ft: pushed pitcher sample 24", 24" recovery (continued)
80								
83.0	83.0 ft: Changes to olive green and grayish green	MH				UD-8, UNDIST REC=19", 79%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	83.0 - 85.0 ft: pushed pitcher sample 24", 19" recovery 83.0 - 93.0 ft: olive gray and grayish green drilling fluid, cuttings observed are clumps of silty sand fine sand
85								
90								
92.0	92.0 - 101.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction	ML	-84.1			UD-9, UNDIST REC=21", 88%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	93.0 - 95.0 ft: pushed pitcher sample 24", 24" recovery 93.0 - 103.0 ft: smooth and easy drilling, olive gray drilling fluid, sandy silty fine to medium sand cuttings
95								
100								

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-773A**
Schnabel No.: 06120048
Sheet: 5 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
101.0	101.0 - 121.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains shells, contains mica, weak HCl reaction	SM	-93.1					
						UD-10, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	103.0 - 105.0 ft: pushed pitcher sample 24", 24" recovery 103.0 - 113.0 ft: smooth drilling
					105			
					110			
						UD-11, UNDIST REC=22", 92%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	113.0 - 115.0 ft: pushed pitcher sample 24", 22" recovery 113.0 - 123.0 ft: silty sand fine to medium sand cuttings
					115			
					120			
121.0	121.0 - 134.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction	SM	-113.1					
						UD-12, UNDIST REC=23", 96%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	123.0 - 125.0 ft: pushed pitcher sample 24", 23" recovery 123.0 - 136.0 ft: dark olive gray drilling fluid
					125			

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-773A**
Schnabel No.: 06120048
Sheet: 6 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	130.0 ft: Changes to fine to medium grained sand	SM			130			123.0 - 136.0 ft: dark olive gray drilling fluid (continued)
134.0	134.0 - 150.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction	ML	-126.1		135	UD-13, UNDIST REC=22", 92%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	136.0 - 138.0 ft: pushed pitcher sample 24", 22" recovery 136.0 - 148.0 ft: olive gray drilling fluid
					140			
					145			
150.0			-142.1		150	UD-14, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	
Bottom of Boring at 150.0 ft. Boring backfilled with cuttings upon completion.								

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-773
Schnabel No.: 06120048
Sheet: 1 of 9

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: M. Lark
Schnabel Representative: W. Bradfield
Equipment: Diedrich D-50 (Track ATV); AWJ Rods
Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)
Dates Started: 7/24/08 **Finished:** 7/30/08
Easting: 961045.9 ft **Northing:** 219241.3 ft **By:** Land Survey
Coordinate System: MD State Plane

Ground Surface Elevation: 7.9 (ft) **Total Depth:** 165.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/24	7:00 AM	5.0'	4.0'	---
Start of Day	7/28	8:20 AM	6.5'	9.0'	---
Start of Day	7/29	7:20 AM	0.4'	9.0'	---
Completion	7/30	8:45 AM	8.4'	9.0'	---

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.3	0.0 - 0.3 ft: Rootmat and topsoil		7.6			S-1, SPT 2+7+8 REC=8", 44%		0.0 - 2.5 ft: advanced 4 1/4" ID HSA to 9 ft
2.0	0.3 - 2.0 ft: FILL, sampled as clayey sand with gravel, fine to coarse grained sand, subrounded to subangular particles, moist, orangish brown with light brownish yellow, estimated 15 - 25% crushed stone, estimated <5% roots, no HCl reaction, coarse sand crumble, fine gravel fracture	FILL	5.9			S-2, SPT 2+3+5 REC=15.5", 86%		0.0 - 2.5 ft: uniform drilling resistance, smooth drilling, minor grinding on fine gravel, orangish brown cuttings; changes as noted below. see end of boring log for additional remarks.
4.5	2.0 - 4.5 ft: PROBABLE FILL, sampled as clayey sand, fine to medium grained sand, moist, light brownish yellow with bands of light orangish brown, estimated <5% grass, rounded fine gravel, alternating colors from 0.13 - 0.5 ft, with 0.13 - 0.5 inch thick layer of sandy clay, fine sand, moist, light gray, stratified	FILL	3.4		5	S-3, SPT 1+1+1 REC=18", 100%		2.5 - 5.0 ft: light brown cuttings
7.0	4.5 - 7.0 ft: PROBABLE FILL, sampled as clayey sand, fine to medium grained sand, wet, light gray, no HCl reaction, stratified 0.5 inch with bands of light brownish yellow and light orangish colors	FILL	0.9			S-4, SPT WOH+18 REC=15", 83%		5.0 - 7.5 ft: driller advanced in 1st gear to maintain borehole integrity, light yellowish brown cuttings
9.5	7.0 - 9.5 ft: PROBABLE FILL, sampled as clayey sand, fine to medium grained sand, wet, light yellowish brown with mottles of light orangish brown, no HCl reaction, light gray, sandy lean clay pockets 0.25 - 0.5 inch thick	FILL	-1.6			S-5, SPT WOH+1+12 REC=9", 50%		7.5 - 9.0 ft: light brownish gray cuttings
11.2	9.5 - 11.2 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, subrounded particles, wet, gray, no HCl reaction, homogenous structure, coarse sand crumbles	SP-SM	-3.3		10	S-6, SPT 5+17+27 REC=13", 72%		9.0 ft: pulled out 4 1/4" ID HSA, installed 6" ID PVC casing into borehole and grouted annulus
12.0	11.2 - 12.0 ft: SILTY SAND, fine to coarse grained sand, angular to subrounded particles, wet, light gray with streaks of white, estimated 15 - 25% cemented sands, estimated 5 - 10% shell fragments, no HCl reaction, medium to coarse sand sized, moderate to highly weathered shell fragments, with fine gravel and some medium to coarse sand cemented sands or shells	SM	-4.1					9.0 ft: switched to 3 1/2" OD tricone roller bit (mud rotary) and advanced to 165 ft, mud mix: 50lbs bentonite powder to 100 gallons of water
	12.0 - 15.9 ft: SILTY SAND, fine to coarse grained sand, angular to	SM						9.0 - 10.0 ft: uniform drilling resistance, smooth drilling, light gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
15.9	subangular particles, light gray with streaks of white, estimated 30 - 45% shell fragments, estimated 30 - 45% cemented sands, angular fine gravel, medium to coarse sand and fine gravel size fresh to highly weathered shell fragments, coarse to fine gravel size cemented sand, strong HCl reaction (with shells), no HCl reaction (with soil), strong HCl reaction (with cemented sands), moderate to strong cementation 15.0 ft: Changes to contains fine to coarse gravel	SM	-8.0			S-7, SPT 15+6+6 REC=16", 89%		10.0 - 11.2 ft: jar labeled as S-5A 11.2 - 11.5 ft: jar labeled as S-5B 11.5 ft: harder drilling with slight rig chatter, light brownish gray drilling fluid 11.8 ft: softer drilling, uniform drilling resistance 12.5 - 15.0 ft: intermittent hard and soft drilling with rig chatter light gray drilling fluid
19.5	15.9 - 19.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray with streaks of white, estimated 5 - 10% shell fragments, medium to coarse sand size highly weathered to fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil) 19.5 - 24.5 ft: SILTY SAND, fine to medium grained sand, moist, gray with streaks of white, estimated 5 - 10% shell fragments, estimated 5 - 10% cemented sands, weak cementation, moderate to highly weathered shell fragments, fine gravel sized cemented sands, strong HCl reaction (with shells), weak HCl reaction (with soil and cemented sands)	SP-SM	-11.6		20	S-8, SPT 5+12+19 REC=18", 100%		15.0 - 15.9 ft: jar labeled as S-7A 15.0 - 19.0 ft: uniform resistance, smooth drilling 15.9 - 16.5 ft: jar labeled as S-7B 19.5 - 20.0 ft: slightly harder drilling with rig chatter 20.0 - 25.0 ft: uniform drilling resistance, smooth drilling
24.5	24.5 - 29.0 ft: CLAYEY SAND, fine to medium grained sand, moist, gray with streaks of white, estimated 5 - 10% shell fragments, estimated <5% cemented sands, weak cementation, moderate to highly weathered shell fragments, coarse sand to fine gravel sized cemented sands, strong HCl reaction (with shells and cemented sands), weak HCl reaction (with soil) 25.8 ft: Changes to estimated 30 - 45% shell fragments	SC	-16.6		25	S-9, SPT 2+4+12 REC=18", 100%		26.8 - 27.4 ft: slightly harder drilling with rig chatter
29.0	29.0 - 34.0 ft: SILTY SAND, fine grained sand, moist, dark grayish green with speckles of light brownish white, estimated <5% shell fragments, coarse sand to fine gravel sized highly weathered to fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SM	-21.1		30	S-10, SPT 3+4+6 REC=16.5", 92%		30.0 - 35.0 ft: smooth drilling, uniform drilling resistance
34.0	34.0 - 38.5 ft: SANDY SILT, fine to medium grained sand, moist, grayish green, weak HCl reaction, firm, homogenous structure	ML	-26.1		35			

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
		ML				S-11, SPT 4+6+8 REC=18", 100%		35.0 - 40.0 ft: gray drilling fluid (continued)
38.5	38.5 - 44.0 ft: SILTY SAND, fine to medium grained sand, moist, grayish green with speckles of light brownish white, estimated <5% shell fragments, homogenous structure, medium to coarse sand sized fresh to moderately weathered shells, strong HCl reaction (with shells), no HCl reaction (with soil)	SM	-30.6		40	S-12, SPT 3+4+6 REC=18", 100%		
44.0	44.0 - 49.0 ft: SILTY SAND, fine to medium grained sand, wet, grayish green with speckles of white, estimated 5 - 10% shell fragments, contains mica, medium sand to fine gravel sized shell fragments, fresh to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-36.1		45	S-13, SPT 2+2+3 REC=17", 94%		45.0 - 50.0 ft: light grayish green drilling fluid
49.0	49.0 - 54.0 ft: SILTY SAND, fine grained sand, moist, olive gray with streaks of white, estimated <5% shell fragments, moderately to highly weathered shell fragments, strong HCl reaction (with shells), weak to strong HCl reaction (with soil)	SM	-41.1		50	S-14, SPT 3+4+6 REC=18", 100%		
54.0	54.0 - 59.0 ft: SILTY SAND, fine grained sand, moist, olive gray with speckles of white, estimated <5% shell fragments, contains mica, highly weathered shell fragments, strong HCl	SM	-46.1		55	S-15, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
	reaction (with shells), weak to strong HCl reaction (with soil)				4+5+7 REC=18", 100%		
59.0	59.0 - 74.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, homogenous structure	SM	-51.1		60 S-16, SPT 4+4+6 REC=18", 100%		60.0 - 65.0 ft: clumps of fine silty sand, fine to medium sand and medium sand sized shell fragments
	60.9 ft: Changes to with streaks of white, estimated <5% shell fragments, highly weathered shell fragments, strong HCl reaction (with shells)				65 S-17, SPT 3+4+5 REC=18", 100%		
	65.0 ft: Changes to fine grained sand, moist, olive gray, contains mica, weak HCl reaction, homogenous structure	SM			70 S-18, SPT 3+4+6 REC=18", 111%		
74.0	74.0 - 94.0 ft: SANDY ELASTIC SILT, fine grained sand, moist, grayish green, contains mica, strong HCl reaction, hard, homogenous structure	MH	-66.1		75 S-19, SPT 4+6+7		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
					REC=18", 100%		75.0 - 80.0 ft: greenish gray drilling fluid, cuttings consist of clumps of fine sandy silty /silty sand, fine to medium sand and few medium sand sized shell fragments (continued)
	80.0 ft: Changes to weak HCl reaction				80 S-20, SPT 4+7+8 REC=18", 100%		
					85 S-21, SPT 4+5+7 REC=18", 100%		85.0 - 90.0 ft: cuttings contain large clumps (1-3") of fine sandy silt, fine to medium sand and some medium sand sized shell fragments
					90 S-22, SPT REC=18", 100%		90.0 - 95.0 ft: cuttings contain clumps of fine sandy silt/silty sand, fine to medium sand and medium sand sized shell fragments
94.0	94.0 - 99.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, lensed, with 0.25 - 0.5 inch pockets of FINE SANDY SILT (ML)	SM	-86.1		95 S-23, SPT 7+7+9 REC=18", 100%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04 22 GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
99.0	99.0 - 108.5 ft: SILTY SAND, fine grained sand, moist, olive gray with speckles of white, estimated <5% shell fragments, contains mica, weak HCl reaction, homogenous structure, fine sand sized moderately to highly weathered shell fragments, difficult to differentiate HCl reaction between soil and shell fragments	SM	-91.1				
	105.0 ft: Changes to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM					100.0 - 105.0 ft: cuttings contain fine to medium sand, clumps of fine silty sand/sandy silt and fine to medium sand sized shell fragments
108.5	108.5 - 114.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, homogenous structure	SM	-100.6				
							111.5 - 113.5 ft: softer drilling, faster penetration rate, greenish gray drilling fluid
114.0	114.0 - 119.0 ft: SILTY SAND, fine to medium grained sand, wet, olive gray with speckles of light brownish white, estimated 5 - 10% shell fragments, lensed, medium sand to fine gravel size moderately weathered to fresh shell fragments, strong HCl reaction	SM	-106.1				113.5 - 115.0 ft: slightly harder drilling with uniform drilling resistance, smooth drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	(with shells), no HCl reaction (with soil), 0.5 inch pockets of SANDY SILT (ML)	SM						
119.0	119.0 - 138.0 ft: SILTY SAND, fine to medium grained sand, moist, olive gray, contains mica, no HCl reaction, homogenous structure		-111.1					
					120	S-28, SPT 3+3+7 REC=18", 100%		120.0 - 125.0 ft: cuttings contain fine to medium sand and fine to medium sand sized shell fragments, some < 1" clumps of fine sandy silt
					125	S-29, SPT 3+4+6 REC=18", 100%		125.0 - 130.0 ft: grayish green drilling fluid
	125.0 ft: Changes to fine grained sand, weak HCl reaction				130	S-30, SPT 3+5+8 REC=18", 100%		130.0 - 135.0 ft: greenish gray drilling fluid, cuttings consist of fine to medium sand with minor clumps of fine silty sand/sandy silt, trace amount of fine to medium sand sized shell fragments
		SM			135	S-31, SPT 3+5+9 REC=18", 100%		135.0 - 140.0 ft: grayish green drilling fluid
	135.0 ft: Changes to no to weak HCl reaction							

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
138.0	138.0 - 144.0 ft: SILTY SAND, fine grained sand, moist, grayish green with speckles of white, estimated <5% shell fragments, contains mica, weak HCl reaction, homogenous structure, fine to medium sand sized highly weathered shell fragments	SM	-130.1					135.0 - 140.0 ft: grayish green drilling fluid (continued)
		SM			140	S-32, SPT 5+6+10 REC=18", 100%		140.0 - 145.0 ft: cutting consist of fine to medium sand sized shell fragments, trace small (<3/4") clumps of fine sandy silt
144.0	144.0 - 165.0 ft: SILTY SAND, fine grained sand, moist, grayish green, contains mica, weak HCl reaction, homogenous structure	SM	-136.1		145	S-33, SPT 4+7+8 REC=18", 100%		
					150	S-34, SPT 4+7+9 REC=18", 100%		
		SM			155			150.0 ft: test boring completed to plan depth of 150 ft; upon completion of boring, reamed to 165 ft with 5" O.D. tricone roller bit

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-773**
Schnabel No.: 06120048
Sheet: 9 of 9

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
165.0		SM	157.1		165			

Bottom of Boring at 165.0 ft.

NOTE: No groundwater measurements taken 7/24 (end of day) or 7/25 (start of day) due to PVC grouting activities.

Upon removal of 4 1/2" I.D. HSA 6" I.D. pvc pipe installed to 9.0 ft as per specification and annular space filled with grout.

Drilling commenced following pvc pipe using 3 1/2" O.D. tricone roller bit to 165.0 ft.

Upon completion of boring, reamed hole with 5" O.D. tricone roller bit to 165.0 ft to meet specification for downhole geophysical logging equipment (with 15 ft of overdrill for "rat-hole" to accommodate geophysical probe.

Performed downhole geophysical logging upon completion of ream.

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-774**
Schnabel No.: 06120048
Sheet: 1 of 8

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: M. Lark

Schnabel Representative: W. Bradfield

Equipment: CME-75 (ATV); AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-cone Roller Bit,
6" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/30/08 Finished: 8/7/08

Easting: 961000.5 ft Northing: 219196 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 10.1 (ft) Total Depth: 150.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/30	2:01 PM	13.0'	11.5'	---
Start of Day	7/31	7:48 AM	6.0'	13.5'	---
Start of Day	8/1	7:25 AM	6.5'	13.5'	---
Start of Day	8/4	9:15 AM	7.5'	13.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
0.3	0.0 - 0.3 ft: Topsoil		9.8		S-1, SPT 2+7+10 REC=15", 83%		0.0 ft: advanced 6 1/4" ID HSA to 13.5 ft
2.0	0.3 - 2.0 ft: FILL, sampled as clayey sand with gravel, fine to coarse grained sand, angular to subrounded particles, moist, brown with mottles of reddish brown, estimated 5 - 10% crushed stone, no HCl reaction, fine to coarse gravel, rounded to angular gravel, coarse sand crumble, fine to coarse gravel fracture	FILL	8.1		S-2, SPT 6+10+9 REC=13", 72%		0.0 - 2.5 ft: hard drilling significant rig chatter, brown and yellowish cuttings; changes as noted below, see end of boring log for additional remarks
5.0	2.0 - 5.0 ft: FILL, sampled as poorly graded sand with clay, medium grained sand, subangular to rounded particles, moist, yellowish red with mottles of grayish yellow, no HCl reaction, coarse sand fractures	FILL	5.1		S-3, SPT 8+9+7 REC=5", 28%		2.5 - 5.0 ft: uniform drilling resistance, smooth drilling, yellowish red cuttings
7.0	5.0 - 7.0 ft: FILL, sampled as clayey sand with gravel, medium to coarse grained sand, rounded to angular particles, moist, reddish brown, no HCl reaction, rounded coarse gravel, coarse sand and gravel fracture, gravel ius quartzite at top of sample	FILL	3.1		S-4, SPT 2+7+9 REC=11", 61%		5.0 - 7.5 ft: very hard drilling, slow penetration rate, significant grinding, reddish brown cuttings
	7.0 - 11.5 ft: FILL, sampled as clayey sand, fine to medium grained sand, moist, light yellowish brown with bands of light gray, no HCl reaction, lensed, clay lense is light gray, 3/4" fine to medium sandy lean clay pocket @ 8.1	FILL			S-5, SPT 1+1+1 REC=9", 50%		7.5 - 10.0 ft: uniform drilling resistance, smooth drilling, light red cuttings
11.5	9.5 ft: Changes to fine to coarse grained sand, rounded particles, light red and light brown, interbeds sandy lean clay interbeds, fine to medium sand, moist, light gray no HCl reaction, very soft (1 to 3 inch thick)				UD-1, UNDIST REC=19", 99%	PP = 0.00 tsf PP = 0.00 tsf PP = 0.00 tsf	11.5 - 13.1 ft: pushed shelby tube 19", 19" recovery
13.4	11.5 - 13.4 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray with speckles of white, estimated 5 - 10% shell fragments, medium sand size moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-1.4		S-6, SPT 38+50/1.5" REC=7", 97%		11.5 - 13.5 ft: at 13.4 ft, hard drilling with rig chatter
	13.1 ft: Changes to estimated <5% shell fragments	SP-SM	-3.3				13.1 - 13.4 ft: jar labeled as S-6A
14.5	13.4 - 14.5 ft: POORLY GRADED SAND WITH SILT AND GRAVEL, fine	SC	-4.4				13.4 - 13.7 ft: jar labeled as S-6B

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
16.5	to coarse grained sand, angular to subrounded particles, wet, gray and light gray, estimated 50 - 100% cemented sands, estimated 30 - 45% shell fragments, angular fine to coarse gravel, coarse sand to coarse gravel sized cemented sands, medium sand to fine gravel sized moderately weathered shell fragments, strong HCl reaction (with shells and cemented sands), no HCl reaction (with soil), moderate to strong cementation	SC	-6.4			S-7, SPT 7+24+32 REC=14", 78%		13.5 ft: switched to 6" OD tricone roller bit (mud rotary) and advanced to 53.5 ft; 35 lbs powdered bentonite to ~ 100 gals water
20.0	14.5 - 16.5 ft: CLAYEY SAND, fine to coarse grained sand, angular particles, wet, light gray with mottles of dark gray, estimated 30 - 45% cemented sands, estimated 30 - 45% shell fragments, moderate cementation, subangular to angular fine to coarse gravel, coarse sand to coarse gravel as cemented sands, medium to fine gravel sized shell fragments, strong HCl reaction (with cemented shells and sand), no HCl reaction (with soil)	SM	-9.9		20	UD-2, UNDIST REC=16.5", 69%	PP = 0.50 tsf PP = 0.50 tsf PP = 0.75 tsf	15.0 - 16.5 ft: very hard drilling with rig chatter, light brown drilling fluid
21.5	16.5 - 20.0 ft: SILTY SAND, fine to medium grained sand, wet, gray with speckles of white, estimated 15 - 25% shell fragments, medium sand to fine gravel sized moderately weathered to fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SM	-11.4			S-8, SPT 3+6+10+ REC=11", 61%		16.5 - 18.5 ft: pushed pitcher sample 24", 16.5" recovery (bottom 0.5 inch deformed)
25.0	18.5 ft: Changes to with streaks of white, estimated 5 - 10% cemented sands, medium to coarse sand sized highly weathered shell fragments, coarse sand to fine gravel sized cemented sands, weak HCl reaction (with cemented sands), weak to moderate cementation	SM	-14.9		25	S-9, SPT 7+11+12 REC=11.5", 64%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	16.5 - 20.0 ft: uniform drilling resistance, smooth drilling, light gray drilling fluid
27.0	20.0 - 21.5 ft: SILTY SAND, fine to medium grained sand, moist, gray with streaks of white, estimated 15 - 25% shell fragments, estimated <5% cemented sands, weak cementation, highly to moderately weathered shell fragments, coarse sand sized cemented sand, strong HCl reaction (with shells), weak HCl reaction (with cemented sands)	SM	-16.9			UD-3, UNDIST REC=23", 96%		21.5 - 23.5 ft: pushed pitcher sample 24", 23" recovery
35.0	21.5 - 25.0 ft: SILTY SAND WITH GRAVEL, fine to coarse grained sand, angular to subangular particles, moist, gray with mottles of white, estimated 30 - 45% shell fragments, estimated 30 - 45% cemented sands, coarse sand to coarse gravel cemented sands, medium sand to fine gravel size highly weathered shell fragments, strong HCl reaction (with shells and cemented sands), weak HCl reaction (with soil), coarse sand to coarse gravel and some medium sands are either cemented sands or shell fragments, weak to strong cementation	SM	-24.9		30	S-10, SPT 19+32+19 REC=14", 78%		25.0 - 27.5 ft: uniform drilling resistance, smooth drilling, light brownish white drilling fluid
	23.5 ft: Changes to with streaks of white					S-11, SPT 5+5+11 REC=17", 94%		
	25.0 - 27.0 ft: SILTY SAND, fine to medium grained sand, moist, grayish green with streaks of light brownish white, estimated 15 - 25% shell	SM			35	S-12, SPT 2+3+2 REC=18", 100%	PP = 3.50 tsf PP = 3.50 tsf PP = 4.00 tsf	31.5 - 33.5 ft: pushed pitcher sample 24", 23" recovery
						S-13, SPT 3+3+6 REC=17", 94%		
						UD-4, SPT REC=23", 96%		
						S-14, SPT 6+7+11 REC=18", 100%		

(continued)



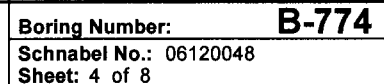
TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-774
Schnabel No.: 06120048
Sheet: 3 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	fragments, estimated <5% cemented sands, light brownish white and white shell fragments, medium to coarse sand sized highly to moderately weathered shell fragments, fine gravel sized cemented sands, strong HCl reaction (with shells), weak HCl reaction (with cemented sands and soil)	SM				S-15, SPT 4+6+8 REC=18", 100%		
38.4	27.0 - 35.0 ft: SILTY SAND, fine grained sand, moist, gray with streaks of white, estimated 5 - 10% shell fragments, medium to coarse sand sized highly to moderately weathered shell fragments, weak HCl reaction (with shells), strong HCl reaction (with shells), contains 1" thick lense of SANDY SILT (ML), fine sand, gray, very soft at 28.1	CL	-28.3			S-16, SPT 4+7+10 REC=18", 100%		37.5 - 38.4 ft: jar labeled as S-16A 37.5 - 40.0 ft: light greenish gray drilling fluid 38.4 - 39.0 ft: jar labeled as S-16B
39.5	29.5 ft: Changes to fine to medium grained sand, gray with speckles of white, estimated <5% shell fragments, moderately weathered to fresh shell fragments,	SM	-29.4		40	S-17, SPT 4+5+7 REC=18", 100%		
41.5	31.2 ft: Changes to gray with streaks of white, estimated 15 - 25% shell fragments, highly to moderately weathered shell fragments 31.5 ft: Changes to gray with speckles of white, estimated <5% shell fragments, no HCl reaction with soil 33.5 ft: Changes to grayish green with speckles of white, estimated <5% shell fragments, medium sand sized highly to moderately weathered shell fragments		-31.4			UD-5, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	41.5 - 43.5 ft: pushed pitcher sample 24"; 24" recovery
	35.0 - 38.4 ft: SILTY SAND, fine to medium grained sand, moist, grayish green, contains mica, no HCl reaction, homogenous structure	SM			45	S-18, SPT 4+7+11 REC=18", 100%		
	38.4 - 39.5 ft: SANDY LEAN CLAY, fine grained sand, moist, grayish green with speckles of light brown, estimated <5% shell fragments, hard, homogenous structure, medium sand sized moderately weathered to fresh shell fragments, contains mica, strong HCl reaction (with shells), weak HCl reaction (with soil)					S-19, SPT 4+6+8 REC=18", 100%		
	39.5 - 41.5 ft: SILTY SAND, fine grained sand, moist, grayish green, contains mica, homogenous structure, no to weak HCl reaction				50	S-20, SPT 2+4+4 REC=18", 100%		
51.5	41.5 - 51.5 ft: SILTY SAND, fine grained sand, moist, grayish green with streaks of brownish white, estimated <5% shell fragments, homogenous structure, highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soi)		-41.4			S-21, SPT 4+5+10 REC=18", 100%		
	43.5 ft: Changes to fine grained sand, with speckles of light brownish white, contains mica, weak HCl reaction (with soil)	SM				UD-6, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	51.5 - 53.5 ft: pushed pitcher sample 24"; 24" recovery
	44.3 ft: Changes to estimated 5 - 10% shell fragments, medium to coarse sand sized moderately to highly weathered shell fragments					S-22, SPT 6+10+11 REC=18", 100%		53.5 ft: switched to 3 1/2" OD tricone roller bit and advanced to 81.5 ft, uniform drilling resistance,
	45.0 ft: Changes to estimated <5% shell fragments				55	S-23, SPT		

(continued)



TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04 22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	grained sand, moist, grayish green, contains mica, weak HCl reaction, hard					REC=18", 100%		75.4 - 76.5 ft: jar labeled as S-31B (continued)
	77.5 ft: Changes to homogenous structure	MH				S-32, SPT 4+6+8 REC=18", 100%		
79.5	79.5 - 81.5 ft: ELASTIC SILT WITH SAND, fine grained sand, moist, grayish green, contains mica, weak HCl reaction, hard, homogenous structure	MH	-69.4		80	S-33, SPT 4+5+7 REC=18", 100%		
81.5	81.5 - 83.5 ft: SANDY ELASTIC SILT, fine grained sand, moist, grayish green, contains mica, weak HCl reaction, hard, homogenous structure	MH	-71.4			UD-7, UNDIST REC=22", 92%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	81.5 ft: switched to 6" OD tricone roller bit, reamed borehole from 53.5 to 81.5; mixed new batch of lean mud (25 lbs powdered bentonite to ~100 gal water)
83.5	83.5 - 85.0 ft: ELASTIC SILT WITH SAND, fine grained sand, moist, grayish green, contains mica, weak HCl reaction, hard, homogenous structure	MH	-73.4			S-34, SPT 6+7+10 REC=18", 100%		81.5 - 83.5 ft: pushed pitcher sample 24"; 22" recovery
85.0	85.0 - 92.0 ft: SANDY ELASTIC SILT, fine grained sand, moist, grayish green, contains mica, weak HCl reaction, hard, homogenous structure	MH	-74.9		85	S-35, SPT 4+6+9 REC=18", 100%		83.5 - 85.0 ft: switched to 3-1/2" tricone roller bit; uniform resistance, smooth drilling, gray drilling fluid
	90.0 ft: Changes to grayish green with mottles of gray	MH				S-36, SPT 4+4+7 REC=18", 100%		
					90	S-37, SPT 4+6+9 REC=18", 100%		
92.0	92.0 - 95.0 ft: ELASTIC SILT WITH SAND, fine grained sand, moist, grayish green, contains mica, weak HCl reaction, hard, homogenous structure	MH	-81.9			S-38, SPT 7+10+11 REC=18", 100%		92.5 - 95.0 ft: greenish gray drilling fluid
95.0	95.0 - 95.7 ft: ELASTIC SILT, fine grained sand, moist, grayish green, contains mica, weak HCl reaction,	MH	-84.9		95	S-39, SPT 6+8+10 REC=18", 100%		95.0 - 95.7 ft: jar labeled as S-39A
95.7			-85.6					

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	hard, homogenous structure 95.7 - 105.0 ft: SILTY SAND, fine grained sand, moist, grayish green, contains mica, weak HCl reaction 97.5 ft: Changes to olive gray, homogenous structure	SM					95.7 - 96.5 ft: jar labeled as S-39B (continued) 97.5 - 100.0 ft: dark greenish gray drilling fluid
		SM			100	S-40, SPT 5+8+8 REC=18", 100% S-41, SPT 5+8+10 REC=18", 100% UD-8, UNDIST REC=24", 100% S-42, SPT 4+12+13 REC=18", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf 101.5 ft: switched to 6" OD tricone roller bit, reamed borehole from 81.5 to 101.5 ft 101.5 - 103.5 ft: pushed pitcher sample 24"; 24" recovery 103.5 ft: switched to 3 1/2" OD tricone roller bit and advanced to 111.5 ft, uniform drilling resistance, smooth drilling, grayish green drilling fluid 105.0 - 107.5 ft: gray drilling fluid 107.5 - 110.0 ft: light olive gray drilling fluid
105.0	105.0 - 107.0 ft: SANDY ELASTIC SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm, homogenous structure	MH	-94.9		105	S-43, SPT 4+5+9 REC=18", 100%	
107.0	107.0 - 109.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, homogenous structure	SM	-96.9			S-44, SPT 5+6+8 REC=18", 100%	
109.5	109.5 - 111.5 ft: SANDY ELASTIC SILT, fine grained sand, moist, grayish green, contains mica, weak HCl reaction, hard, homogenous structure	MH	-99.4		110	S-45, SPT 5+7+9 REC=18", 100%	
111.5	111.5 - 113.5 ft: SILTY SAND, fine grained sand, moist, grayish green, contains mica, weak HCl reaction	SM	-101.4			UD-9, UNDIST REC=23", 96%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf
113.5	113.5 - 115.0 ft: SILTY SAND, fine to medium grained sand, moist, olive gray, contains mica, weak HCl reaction, homogenous structure	SM	-103.4			S-46, SPT 4+5+7 REC=18", 100%	
115.0	114.5 ft: Changes to with streaks of light brownish white, estimated <5% shell fragments, light brownish white shells, highly weathered shell fragments	SM	-104.9		115	S-47, SPT 2+5+6 REC=16", 89%	113.5 ft: switched to 3 1/2" OD tricone roller bit and advanced to 121.5 ft, uniform drilling resistance, smooth drilling, greenish gray

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
117.5	115.0 - 117.5 ft: SILTY SAND, fine to medium grained sand, olive gray with streaks of white, estimated 5 - 10% shell fragments, white shell fragments, medium to coarse sand sized moderately to highly weathered shell fragments, weak to strong HCl reaction (with shells), no to weak HCl reaction (with soil)	SM	-107.4			S-48, SPT 4+5+9 REC=12", 67%		drilling fluid 115.0 ft: switched to 6" OD tricone roller bit, reamed borehole from 101.5 to 121.5 ft 115.1 - 113.5 ft: pushed pitcher sample 24"; 23" recovery 117.5 - 120.0 ft: light olive gray drilling fluid
121.5	117.5 - 121.5 ft: SILTY SAND, fine to medium grained sand, wet, olive gray with streaks of light brownish white, estimated 15 - 25% shell fragments, contains mica, light brown and light brownish white shell fragments, medium sand to fine gravel sized shell fragments, no HCl reaction (with soil), weak to strong HCl reaction (with shells) 120.0 ft: Changes to fine grained sand, moist, olive gray with streaks of white, estimated <5% shell fragments, medium to coarse sand sized highly to moderately weathered shell fragments 121.5 - 140.0 ft: SILTY SAND, fine to medium grained sand, moist, grayish green, contains mica, weak HCl reaction, some pockets/layers <0.5 inch thick of mostly medium grained sand 125.0 ft: Changes to fine grained sand, homogenous structure	SM	-111.4		120	S-49, SPT 2+3+7 REC=17", 94%		
						UD-10, UNDIST REC=18", 75%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	121.5 - 123.5 ft: pushed pitcher sample 24"; 18" recovery
					125	S-50, SPT 5+8+16 REC=18", 100%		123.5 - 125.0 ft: switched to 3 1/2" tricone roller bit and advanced to 131.5 ft, uniform drilling resistance, smooth drilling, light olive gray drilling fluid
						S-51, SPT 3+5+8 REC=15", 83%		125.0 - 127.5 ft: grayish green drilling fluid
						S-52, SPT 3+4+7 REC=18", 100%		
		SM			130	S-53, SPT 4+4+6 REC=18", 100%		
						UD-11, UNDIST REC=22.5", 94%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	131.5 ft: switched to 6" OD tricone roller bit and reamed borehole from 121 to 131.5 ft 131.5 - 133.5 ft: pushed pitcher sample 24"; 22.5" recovery
						S-54, SPT 6+7+8 REC=0", 0%		
					135	S-55, SPT 3+6+9 REC=0", 0%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
140.0	140.0 - 141.5 ft: SILTY SAND, fine grained sand, moist, grayish green, contains mica, weak HCl reaction, homogenous structure	SM	129.9		S-56, SPT 3+6+12 REC=0", 0%		135.0 - 137.5 ft: sampler basket was inverted, possibly due to suction pulling sample back out of spoon (continued)
141.5	141.5 - 150.0 ft: SANDY ELASTIC SILT, fine grained sand, moist, grayish green, contains mica, weak HCl reaction, hard	SM	131.4		S-57, SPT 4+8+12 REC=18", 100%		137.5 - 140.0 ft: no recovery, new basket used, good condition, ball chuck valve at top of spoon free and loose, poor recovery may be due to soils made soft by drilling fluid
	143.5 ft: Changes to homogenous structure				UD-12, UNDIST REC=20", 83%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	137.5 - 140.0 ft: dark greenish gray drilling fluid, cuttings contain fine to medium sand with some medium to coarse sized shell fragments and small clumps (<0.5 inch), of fine sandy silt/silty sand
		MH			S-58, SPT 8+9+12 REC=18", 100%		
					S-59, SPT 5+9+12 REC=18", 100%		
					S-60, SPT 6+9+11 REC=18", 100%		
150.0			139.9				

Bottom of Boring at 150.0 ft.

Additional Remarks

117.5 ft: Permeation of drilling fluid into sample may have influenced "wet" sample appearance for Sample S-48

140 ft: Switched to 6" OD tricone and reamed borehole from 131.5 to 141.5 ft

141.5 - 143.5 ft: Pushed pitcher sample 24"; 20" recovery

143.5 ft: Switched to 3 1/2" OD tricone roller bit and advanced to 150 ft

143.5 - 145 ft: Uniform drilling resistance, smooth drilling, dark greenish gray drilling fluid

Please refer to original field log for End of Day groundwater observation depths



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-775**
Schnabel No.: 06120048
Sheet: 1 of 6

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/17/08 **Finished:** 7/21/08

Easting: 961091.5 **Northing:** 219105.3 **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 9.7 (ft) **Total Depth:** 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/17	4:50 PM	7.5'	7.5'	---
End of Day	7/17	6:40 PM	1.0'	9.0'	---
Start of Day	7/18	7:25 AM	2.8'	9.0'	---
Completion	7/18	1:25 PM	9.2'	9.0'	18.6'
Start of Day	7/21	8:53 AM	8.3'	9.0'	9.2'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.2	0.0 - 0.2 ft: Topsoil, organics, grass		9.5			S-1, SPT 4+4+13 REC=11", 61%		0.0 - 2.5 ft: advanced 4 1/4" ID HSA to 9 ft; bit chatter from 0 to 0.8 ft; brown cuttings; changes as noted below. see end of boring for additional remarks
2.0	0.2 - 2.0 ft: FILL, sampled as poorly graded sand with gravel, medium to coarse grained sand, subrounded particles, moist, brown, estimated <5% crushed stone, no HCl reaction, rounded fine gravel	FILL	7.7			S-2, SPT 3+6+6 REC=14", 78%		2.5 - 5.0 ft: uniform drilling resistance, gray cuttings at 3 ft
4.5	2.0 - 4.5 ft: FILL, sampled as clayey sand, fine to coarse grained sand, subangular to rounded particles, moist, gray and brown, estimated <5% fine gravel, estimated <5% crushed stone, estimated <5% shell fragments, fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	FILL	5.2			S-3, SPT 3+12+14 REC=16", 89%		5.0 ft: orangish brown cuttings
7.0	4.5 - 7.0 ft: POORLY GRADED SAND, medium to coarse grained sand, subrounded to subangular particles, moist, brownish orange, estimated 5 - 10% fine gravel, no HCl reaction, subrounded gravel	SP	2.7		5	S-4, SPT WOH+1/12" REC=13", 72%		7.5 - 9.0 ft: switch to 3 1/2" OD tricone roller bit (mud rotary) and advanced to 100 ft
10.5	7.0 - 10.5 ft: POORLY GRADED SAND, fine to coarse grained sand, subrounded to subangular particles, wet, estimated <5% clay, no HCl reaction	SP	-0.8		10	S-5, SPT 3+4+2 REC=11", 61%		7.5 - 10.0 ft: Uniform resistance, smooth drilling, brown drilling fluid
12.0	10.5 - 12.0 ft: POORLY GRADED SAND, medium to coarse grained sand, subrounded particles, wet, light brown, no HCl reaction	SP	-2.3			S-6, SPT 5+9+13 REC=12", 67%		13.0 ft: bit chatter, gray drilling fluid
14.5	12.0 - 14.5 ft: POORLY GRADED SAND, medium grained sand, subrounded particles, wet, dark gray, contains a 0.5 inch layer of fine gravel, fine gravel as cemented sands at 13.9 ft, strong HCl reaction (with cemented sand), no HCl reaction (with soil)	SP	-4.8					
	14.5 - 17.0 ft: SILTY SAND, fine to	SM						

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
17.0	medium grained sand, wet, gray, estimated 5 - 10% fine gravel, estimated 5 - 10% shell fragments, strong HCl reaction, fine gravel as cemented sands, coarse to fine gravel size fresh shell fragments, moderate to strong cementation	SM	-7.3			S-7, SPT 12+44+50/3" REC=14", 78%		15.0 - 17.5 ft: uniform drilling resistance, smooth drilling
19.5	17.0 - 19.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated <5% fine to coarse gravel, estimated <5% shell fragments, weak HCl reaction, strong cementation, coarse gravel as cemented sands from 17.5 to 18 ft, fresh to moderately weathered shell fragments	SP-SM	-9.8			S-8, SPT 14+7+6 REC=18", 100%		18.5 - 19.5 ft: bit chatter
24.5	19.5 - 24.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, coarse sand to fine gravel size fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-14.8		20	S-9, SPT 3+5+8 REC=15", 83%		20.0 - 22.5 ft: uniform drilling resistance, smooth drilling
27.0	22.5 ft: Changes to coarse sand to fine gravel size fresh to highly weathered shell fragments		-17.3			S-10, SPT 4+4+12 REC=18", 100%		
29.5	24.5 - 27.0 ft: POORLY GRADED SAND, fine grained sand, moist, dark gray, estimated 5 - 10% silt, estimated <5% fine gravel, estimated <5% shell fragments, strong HCl reaction, moderate cementation, fine gravel as cemented sands, coarse sand to fine gravel size highly weathered shell fragments	SP	-19.8		25	S-11, SPT 11+2+5 REC=17", 94%		
32.0	27.0 - 29.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, estimated <5% shell fragments, coarse sand to fine gravel size fresh to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-22.3			S-12, SPT 4+5+9 REC=18", 100%		
34.5	29.5 - 32.0 ft: SILTY SAND, fine grained sand, moist, dark gray, estimated <5% fine gravel, estimated <5% shell fragments, strong HCl reaction, moderate cementation, fine gravel as cemented sands, coarse sand to fine gravel size fresh to highly weathered shell fragments	SM	-24.8		30	S-13, SPT 4+19+25 REC=18", 100%		
	32.0 - 34.5 ft: POORLY GRADED SAND, fine grained sand, wet, dark gray, estimated 5 - 10% silt, estimated <5% shell fragments, weak HCl reaction, coarse sand to fine gravel size moderately weathered shell fragments	SP				S-14, SPT 3+5+8 REC=18", 100%		32.5 - 35.0 ft: Uniform drilling resistance, smooth drilling
	34.5 - 37.0 ft: POORLY GRADED SAND WITH SILT, fine to medium	SP-SM			35			

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
37.0	grained sand, wet, olive gray, estimated <5% shell fragments, no HCl reaction, coarse sand size moderately weathered shell fragments	SP-SM	-27.3			S-15, SPT 5+6+8 REC=18", 100%		
39.5	37.0 - 39.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, fine gravel size highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-29.8			S-16, SPT 5+6+8 REC=18", 100%		
42.0	39.5 - 42.0 ft: SANDY SAND, fine grained sand, moist, olive gray, contains mica, no HCl reaction	SM	-32.3		40	S-17, SPT 6+9+11 REC=18", 100%		
44.5	42.0 - 44.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand size highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SM	-34.8			S-18, SPT 5+7+8 REC=18", 100%		42.5 - 45.0 ft: Uniform drilling resistance, smooth drilling
47.0	44.5 - 47.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, estimated <5% shell fragments, fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-37.3		45	S-19, SPT 4+6+9 REC=18", 100%		
49.5	47.0 - 49.5 ft: SANDY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand size, moderately weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SM	-39.8			S-20, SPT 6+7+7 REC=18", 100%		
52.0	49.5 - 52.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-42.3		50	S-21, SPT 4+5+7 REC=16", 89%		
54.5	52.0 - 54.5 ft: POORLY GRADED SAND, fine to medium grained sand, wet, olive gray, contains mica, estimated 5 - 10% silt, estimated 5 - 10% shell fragments, coarse sand to fine gravel size fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SP	-44.8			S-22, SPT 5+12+14 REC=18", 100%		52.5 - 55.0 ft: Uniform drilling resistance, smooth drilling
	54.5 - 59.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell	SM			55	S-23, SPT		

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-775
Schnabel No.: 06120048
Sheet: 4 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	fragments, strong HCl reaction, coarse sand size highly weathered shell fragment				5+7+9	REC=18", 100%		
	57.5 ft: Changes to estimated <5% shell fragments	SM			S-24, SPT 5+8+11	REC=18", 100%		
59.5	59.5 - 63.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, firm, coarse sand size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	ML	-49.8		S-25, SPT 6+9+12	REC=18", 100%		
63.0	62.5 ft: Changes to weak HCl reaction				S-26, SPT 8+10+10	REC=18", 100%		62.5 - 65.0 ft: Uniform drilling resistance, smooth drilling
	63.0 - 77.0 ft: SILTY SAND, fine grained sand, moist, brownish gray, contains mica, estimated <5% shell fragments, coarse sand size highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)		-53.3		S-27, SPT 5+7+9	REC=18", 100%		
	67.5 ft: Changes to olive gray, estimated <5% shell fragments, strong HCl reaction (with soil)	SM			S-28, SPT 5+6+9	REC=18", 100%		
	70.0 ft: Changes to weak HCl reaction				S-29, SPT 5+7+9	REC=18", 100%		
					S-30, SPT 6+8+9	REC=18", 100%		72.5 - 75.0 ft: Uniform drilling resistance, smooth drilling
					S-31, SPT 5+8+7			

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
77.0	77.0 - 98.5 ft: SILT, moist, olive gray, contains mica, weak HCl reaction, firm	SM	-67.3		REC=18", 100%		
					S-32, SPT 7+8+10 REC=18", 100%		
					80	S-33, SPT 8+9+10 REC=18", 100%	
						S-34, SPT 7+10+12 REC=18", 100%	
					85	S-35, SPT 8+10+11 REC=18", 100%	
						S-36, SPT 7+8+10 REC=18", 100%	
					90	S-37, SPT 7+9+11 REC=18", 100%	
						S-38, SPT 7+10+12 REC=18", 100%	
					95	S-39, SPT 9+12+13 REC=18", 100%	
		ML					82.5 - 85.0 ft: Uniform drilling resistance, smooth drilling
							92.5 - 95.0 ft: Uniform drilling resistance, smooth drilling

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-775**
Schnabel No.: 06120048
Sheet: 6 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
98.5	98.5 - 100.0 ft: SANDY SILT, fine grained sand, moist, contains mica, weak HCl reaction	ML	-88.8					
100.0		ML	-90.3		100	S-40, SPT 9+9+11 REC=18", 100%		

Bottom of Boring at 100.0 ft.
Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

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**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-776
Schnabel No.: 06120048
Sheet: 1 of 3

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-Cone Roller Bit,
6" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/22/08 **Finished:** 7/23/08

Easting: 961053.7 ft **Northing:** 219143 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 9.6 (ft) **Total Depth:** 51.5 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/22	3:08 PM	11.0'	10.0'	---
Start of Day	7/23	7:18 AM	8.5'	14.5'	---
Completion	7/23	8:10 AM	3.8'	14.5'	50.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
2.0	0.0 - 2.0 ft: FILL, sampled as poorly graded sand with gravel, medium to coarse grained sand, angular particles, moist, brown, estimated <5% crushed stone, no HCl reaction	FILL	7.6			S-1, SPT 3+12+13 REC=13", 72%		0.0 - 0.0 ft: Advanced 4 1/4" I.D. HSA to 14.5 ft at 0 to 25 ft interval rig chatter to 0.3 ft, brown cuttings. Changes as noted below. See end of boring log for additional remarks.
	2.0 - 7.0 ft: FILL, sampled as silty sand, medium grained sand, subangular particles, moist, gray and brown, estimated <5% shell fragments, coarse sand size, strong HCl reaction (with shells), strong HCl reaction (with soil)	FILL				S-2, SPT 2+4+6 REC=9", 50%		2.5 - 5.0 ft: Uniform drilling resistance, easy drilling
7.0	5.0 ft: Changes to medium to coarse grained sand, subrounded particles, brown, estimated <5% fine gravel, estimated <5% crushed stone, no HCl reaction		2.6		5	S-3, SPT 6+12+8 REC=13", 72%		5.0 - 7.5 ft: rig chatter at 6.0 ft, brown and gray cuttings
	7.0 - 9.5 ft: SILTY SAND, fine to medium grained sand, moist, orangish brown, no HCl reaction, 0.25 inch lenses of SANDY SILT (ML), fine sand, moist, light gray	SM				S-4, SPT 4+5+5 REC=14", 78%		7.5 - 10.0 ft: Uniform drilling resistance, smooth drilling, brown cuttings
9.5	9.5 - 12.5 ft: SILTY SAND, medium to coarse grained sand, subangular particles, wet, orangish brown and light gray, no HCl reaction, layers of LEAN CLAY (CL)	SM	0.1		10	S-5, SPT 3+1+2 REC=14", 78%		
12.5	12.5 - 17.5 ft: SILTY SAND, fine grained sand, moist, greenish gray, estimated 5 - 10% shell fragments, coarse sand to fine gravel size fresh shell fragments, fine gravel as cemented sands, contains a 3-inch layer of POORLY GRADED SAND (SP), fine sand, wet, dark gray at 13.5 ft, strong HCL reaction (with shells and soil), strong cementation, (cemented sands surrounding shell fragments)	SM	-2.9		15	S-6, SPT 20+26+9 REC=18", 100%		13.5 - 14.5 ft: Uniform drilling resistance smooth drilling despite cemented sands. 14.5 ft: Switch to 3 1/2" O.D.

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
17.5	17.5 - 27.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, olive gray, estimated <5% fine gravel, estimated 5 - 10% shell fragments, contains cemented sands, gravel as cemented sands, coarse sand to fine gravel size moderately to highly weathered shell fragments	SM	-7.9				tricone roller bit (mud rotary), and advanced to 50.0 ft. mix one bag of bentonite with 125 gallons of water to make drilling fluid. 14.5 ft: 14.5 - 18.5 ft: uniform drilling resistance, smooth drilling, brownish gray drilling fluid. 18.5 - 23.5 ft: gray drilling fluid
	23.5 ft: Changes to estimated <5% fine to coarse gravel, estimated <5% shell fragments	SP-SM					
27.0	27.0 - 32.0 ft: SILTY SAND, fine grained sand, moist, olive gray, estimated <5% fine gravel, estimated <5% shell fragments, fine gravel as cemented sands, coarse sand to fine gravel size moderately to high weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil), strong cementation	SM	-17.4				28.5 - 33.5 ft: bit chatter from 24.0 to 24.5 ft.
32.0	32.0 - 36.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, olive gray, estimated <5% shell fragments, fine gravel size moderately weathered shell fragments, contains a 5 inch layer of SILTY SAND (SM) at 34.1 ft, strong HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-22.4				33.5 - 36.5 ft: Uniform drilling resistance, smooth drilling
36.0	36.0 - 38.3 ft: SILT, moist, olive gray	ML	-26.4				

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
38.3	38.3 - 42.5 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, no HCl reaction	ML	-28.7		S-11, SPT 4+8+11 REC=18", 100%		36.5 - 38.3 ft: pushed Shelby tube 20", no pocket penetrometer readings could be taken due to damaged tube. (continued)
42.5	42.5 - 47.8 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-32.9		S-12, SPT 5+7+10 REC=18", 100%		
46.5	46.5 ft: Changes to contains shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)				UD-2, SH REC=16", 103%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	46.5 - 47.8 ft: pushed Shelby tube pushed 16", 16" recovery
47.8	47.8 - 51.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells and soil)	SP-SM	-38.2		S-13, SPT 4+5+7 REC=17", 94%		47.5 - 50.0 ft: Uniform drilling resistance, greenish gray drilling fluid
50.0	50.0 ft: Changes to estimated 5 - 10% shell fragments, fresh to moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)				S-14, SPT 6+6+10 REC=18", 100%		
51.5			-41.9				

Bottom of Boring at 51.5 ft.

Boring backfilled with bentonite and cement grout using tremie pipe upon completion. Please refer to original field log for End of Day groundwater observation depths



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-778**
Schnabel No.: 06120048
Sheet: 1 of 5

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: K. Bell

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-Cone Roller Bit,
6-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 8/18/08 Finished: 8/20/08




Easting: 960740 ft Northing: 219075 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 114± (ft) Total Depth: 121.5 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Start of Day	8/19	7:20 AM	2.5'	9.0'	---
Encountered	8/19	12:55 PM	43.5'	9.0'	---
Start of Day	8/20	7:20 AM	52.0'	9.0'	---
Encountered	8/20	2:38 PM	108.5'	9.0'	---
Completion	8/20	5:45 PM	13.4'	9.0'	48.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS		
					DEPTH	DATA				
0.4	0.0 - 0.4 ft: Rootmat and topsoil		113.1			S-1, SPT 1+4+6 REC=17", 94%		0.0 ft: advanced 6 1/4" ID HSA to 10 ft		
2.0	0.4 - 2.0 ft: SANDY SILT, fine grained sand, moist, light brown, no HCl reaction, soft		111.5				S-2, SPT 9+13+13 REC=18", 100%			0.0 - 2.5 ft: uniform drilling resistance, smooth drilling, orangish brown cuttings; changes as noted below, see end of boring for additional remarks
	2.0 - 13.5 ft: SILTY SAND, fine grained sand, moist, orangish brown, no HCl reaction				5	S-3, SPT 6+9+8 REC=18", 100%		PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf		
	5.0 ft: Changes to orangish-brown and light gray, contains a 1-inch layer of SANDY LEAN CLAY (CL) at 6.4 ft					UD-1, UNDIST REC=24", 100%			6.5 - 8.5 ft: pushed Shelby tube 24", 24" recovery 6.5 - 10.0 ft: brought the bottom of augers up to 9 ft to switch to mud rotary 10.0 ft: switched to 6" OD tricone roller bit (mud rotary) and advanced to 113.5 ft, mixed 125 gals of water with one bag of bentonite 11.5 - 13.5 ft: pushed pitcher sample 24", 24" recovery 13.5 - 18.5 ft: uniform drilling resistance, smooth drilling, brown drilling fluid	
	6.5 ft: Changes to light orangish brown						S-4, SPT 6+9+11 REC=13", 72%			
	10.0 ft: Changes to orangish brown with bands of light gray				10	S-5, SPT 11+11+11 REC=18", 100%				
	11.5 ft: Changes to light orangish brown, lensed, 0.25 inch pockets of LEAN CLAY (CL)					UD-2, UNDIST REC=24", 100%				PP = 0.75 tsf PP = 1.00 tsf PP = 0.75 tsf
13.5	13.5 - 21.0 ft: POORLY GRADED SAND, fine to medium grained sand, moist, orangish brown with bands of light gray, estimated 5 - 10% silt, no HCl reaction, lensed, contains 0.25 to 0.75 inch pockets of LEAN CLAY (CL)		100.0			S-6, SPT 6+8+9 REC=12", 67%				
	18.5 ft: Changes to light orangish brown, contains a 1-inch layer of LEAN CLAY (CL) at 19.3 ft						S-7, SPT 5+10+12 REC=12", 67%			

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
21.0	21.0 - 23.5 ft: SILTY SAND, fine to medium grained sand, moist, orangish brown, estimated <5% fine gravel, no HCl reaction	SP	92.5					
23.5	23.5 - 25.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, orangish brown, no HCl reaction	SM	90.0			UD-3, UNDIST REC=11", 46%		21.5 - 23.5 ft: pushed pitcher sample 24", 11" recovery, tube not preserved, jar sample taken and labeled UD-3
25.5	25.5 - 28.0 ft: SILTY SAND, fine grained sand, moist, orangish brown, no HCl reaction	SP-SM	88.0		25	S-8, SPT 3+5+8 REC=10", 56%		23.5 ft: flush hole to remove cuttings
28.0	28.0 - 38.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, orangish brown with bands of light gray, no HCl reaction, contains a 0.5-inch layer of LEAN CLAY (CL) at 29.8 ft	SM	85.5			S-9, SPT 6+5+5 REC=13", 72%		23.5 - 25.5 ft: pushed pitcher sample 24", 12" recovery, tube not preserved, jar sample taken and labeled as UD-4
31.5	31.5 ft: Changes to orangish brown					UD-5, UNDIST REC=12", 50%		31.5 - 33.5 ft: pushed pitcher sample 24", 12" recovery, tube not preserved, jar sample taken and labeled as UD-5
35.5	35.5 ft: Changes to orangish brown with bands of light gray, stratified, 0.13 to 0.25 inch layers of LEAN CLAY (CL), moist, light gray, soft	SP-SM			35	UD-6, UNDIST REC=10.5", 44%	PP = 1.00 tsf PP = 1.00 tsf PP = 1.00 tsf	33.5 - 35.5 ft: pushed pitcher sample 24", 10.5" recovery
38.0	38.0 - 39.1 ft: SANDY LEAN CLAY, fine grained sand, moist, light gray, no HCl reaction, soft, lensed, 0.13 to 0.25 inch pockets of POORLY GRADED SAND (SP), fine sand, moist, orangish brown	CL	75.5			S-10, SPT 6+7+7 REC=11", 61%		
39.1	39.1 - 43.5 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, contains mica, no HCl reaction, soft	CL	74.4		40	S-11, SPT 2+2+3 REC=17", 94%		38.5 - 39.0 ft: jar labeled as S-11A 39.0 - 40.0 ft: jar labeled as S-11B
43.5	43.5 - 47.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, contains mica, no HCl reaction, (perched water)	SP-SM	70.0		45	UD-7, UNDIST REC=19", 79%	PP = 1.25 tsf PP = 1.75 tsf PP = 1.50 tsf	41.5 - 43.5 ft: pushed pitcher sample 24", 19" recovery
						S-12, SPT 1+2+3 REC=14", 78%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
47.5	47.5 - 51.0 ft: LEAN CLAY, moist, dark gray, contains mica, no HCl reaction, firm, contains a 2 inch layer of POORLY GRADED SAND (SP), fine sand, wet, dark gray at 48.8 ft, contains a 0.5 inch layer of POORLY GRADED SAND (SP), fine sand, wet, dark gray at 49.1 ft	CL	66.0					
51.0	51.0 - 53.5 ft: SANDY SILT, fine grained sand, moist, dark gray, contains mica, no HCl reaction, firm	ML	62.5					
53.5	53.5 - 67.5 ft: SILTY SAND, fine grained sand, moist, dark, contains mica, no HCl reaction		60.0					
58.5 - 61.5 ft: olive gray								
61.5	61.5 - 67.5 ft: POORLY GRADED GRAVEL WITH SAND, fine grained sand, moist, dark gray, no HCl reaction, strong cementation, gravel as cemented sand 63.5 ft: Changes to fine gravel	GP	52.0					
67.5	67.5 - 71.0 ft: SANDY LEAN CLAY, fine grained sand, moist, olive gray, contains mica, no HCl reaction, soft	CL	46.0					
71.0	71.0 - 77.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, no HCl reaction, soft	ML	42.5					
73.5 ft: Changes to firm								

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04 22 GDT 8/27/08

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TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
					75	4+5+5 REC=18", 100%	
77.5	77.5 - 86.0 ft: SILT, moist, olive gray, contains mica, no HCl reaction	ML	36.0		80	S-19, SPT 3+4+7 REC=18", 100%	
						UD-11, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.00 tsf
	83.5 ft: Changes to estimated <5% shell fragments, strong HCl reaction, fine gravel size moderately weathered shell fragments				85	S-20, SPT 6+9+15 REC=18", 100%	81.5 - 83.5 ft: pushed pitcher sample 24", 24" recovery 81.5 - 88.5 ft: olive gray drilling fluid
86.0	86.0 - 87.5 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, no HCl reaction, firm	ML	27.5				
87.5	87.5 - 91.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated 5 - 10% shell fragments, estimated 5 - 10% fine gravel, moderate cementation, coarse sand to fine gravel size moderate to highly weathered shell fragments, fine gravel as cemented sand, strong HCl reaction	SM	26.0		90	S-21, SPT 17+20+22 REC=14", 78%	
91.5	91.5 - 93.5 ft: POORLY GRADED GRAVEL, moist, olive gray, estimated <5% silt, estimated 15 - 25% shell fragments, strong cementation, fine gravel size fresh shell fragments, gravel as cemented sands, strong HCl reaction (with shells and cemented sands)	GP	22.0			UD-12, UNDIST REC=12", 50%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf
93.5	93.5 - 95.5 ft: POORLY GRADED SAND, fine to medium grained sand, wet, olive gray, contains shell fragments, coarse sand sized fresh shell fragments, strong HCl reaction (with shells and soil)	SP	20.0			UD-13, UNDIST REC=14", 58%	PP = 0.00 tsf PP = 0.50 tsf PP = 0.50 tsf
95.5			18.0		95	S-22, SPT 12+19+22 REC=12", 67%	91.5 ft: flushed hole with drilling fluid to remove cuttings 91.5 - 93.5 ft: pushed pitcher sample 24", 2" recovery, 3" hard layer at 92.5 ft encountered during push, tube not preserved, jar sample taken and labeled UD-12
97.5	95.5 - 97.5 ft: POORLY GRADED SAND, fine to medium grained sand, moist, olive gray, contains mica, estimated 5 - 10% shell fragments, coarse sand to fine gravel size fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP	16.0			S-23, SPT 19+22+50/3" REC=10", 64%	91.5 - 93.5 ft: rig chatter from 92.5 to 92.8 ft, olive gray drilling fluid
	97.5 - 103.5 ft: POORLY GRADED SAND, fine to medium grained sand,				100		93.5 - 95.5 ft: pushed pitcher sample 24", 14" recovery

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
103.5	moist, olive gray, estimated 5 - 10% shell fragments, coarse sand sized, moderately weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SP	10.0		UD-14, UNDIST REC=20", 83%	PP = 0.00 tsf PP = 0.50 tsf PP = 0.25 tsf	98.5 - 101.5 ft: bit chatter/hard, slow drilling from 99.7 to 100.2 ft (continued)
103.5 - 111.0	POORLY GRADED SAND, fine to medium grained sand, moist, olive gray, estimated <5% shell fragments, coarse sand sized moderate to highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SP			S-24, SPT 11+11+18 REC=13", 72%		101.5 - 103.5 ft: pushed pitcher sample 24", 20" recovery
108.5	Changes to coarse sand size highly weathered shell fragments, weak HCl reaction (with soil), encountered water table				S-25, SPT 6+8+11 REC=18", 100%		101.5 - 103.5 ft: hammer energy testing not conducted below 100 ft for this rig/hammer/rod system
111.0	111.0 - 117.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, contains shell fragments, coarse sand to fine gravel size fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	2.5		UD-15, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	111.5 - 113.5 ft: pushed sample 24", 24" recovery
113.5	Changes to fine to medium grained sand, estimated 15 - 25% shell fragments, medium sand to fine gravel size fresh to moderately weathered shell fragments	SM			S-26, SPT 10+16+21 REC=18", 100%		113.5 - 118.5 ft: switched to 3-1/2" OD tricone roller bit and advanced to 121.5 ft; 113.5 -118.5 ft interval: smooth drillig, olive gray drilling fluid
117.5	117.5 - 119.5 ft: SILTY SAND, fine grained sand, moist, olive gray, estimated 5 - 10% shell fragments, estimated 5 - 10% fine gravel, strong HCl reaction, strong cementation, coarse sand to fine gravel, fine gravel as cemented sands	SM	-4.0		S-27, SPT 50/6" REC=5", 83%		118.5 - 120.0 ft: bit chatter/hard drilling from 118.5 to 119.5 ft, olive gray drilling fluid
119.5	119.5 - 121.5 ft: SILTY SAND WITH GRAVEL, fine to medium grained sand, moist, estimated 5 - 10% shell fragments, medium sand to fine gravel size fresh to highly weathered shell fragments, fine gravel as cemented sands, strong HCl reaction (with shells and cemented sand), weak HCl reaction (with soil)	SM	-6.0		S-28, SPT 20+12+22 REC=17", 94%		
121.5			-8.0				

Bottom of Boring at 121.5 ft.

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

Please refer to original field log for End of Day groundwater observation depths.



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-779**
Schnabel No.: 06120048
Sheet: 1 of 5

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-cone Roller Bit,
6" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 8/13/08 Finished: 8/18/08

Easting: 960604.8 ft Northing: 218941.1 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 100.8 (ft) Total Depth: 102.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Start of Day	8/14	7:15 AM	4.5'	9.0'	---
Start of Day	8/15	7:30 AM	33.0'	9.0'	---
Encountered	8/15	8:48 AM	93.5'	9.0'	---
Start of Day	8/18	8:10 AM	57.5'	9.0'	---
Completion	8/18	10:55 AM	4.2'	9.0'	102.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.4	0.0 - 0.4 ft: ORGANIC SOIL		100.4			S-1, SPT 2+4+7 REC=18", 100%		0.0 - 2.5 ft: Advanced 6 1/4" I.D. HSA to 10.0 ft. 0.0 to 2.5 ft interval, uniform drilling resistance, smooth drilling, orangish brown cutting. Changes as noted below. See end of boring log for additional remarks.
2.0	0.4 - 2.0 ft: SILT, moist, light brown, no HCl reaction, firm	ML	98.8			S-2, SPT 5+5+7 REC=18", 100%		
4.5	2.0 - 4.5 ft: SANDY SILT, fine grained sand, moist, orangish brown, no HCl reaction, firm	ML	96.3			S-3, SPT 4+5+5 REC=18", 100%		
	4.5 - 8.3 ft: POORLY GRADED SAND, medium to coarse grained sand, subrounded particles, moist, light yellowish brown, no HCl reaction	SP			5	UD-1, UNDIST REC=21", 97%	PP = 0.75 tsf PP = 0.75 tsf PP = 0.75 tsf	6.5 - 8.3 ft: Pushed Shelby tube 22", 21" recovery
8.3	6.5 ft: Changes to fine to medium grained sand, orangish brown		92.5			S-4, SPT 10+13+21 REC=18", 100%		
9.9	8.3 - 9.9 ft: POORLY GRADED SAND WITH SILT, medium to coarse grained sand, subrounded particles, moist, orangish brown, no HCl reaction, weak cementation, contains a 0.25 inch layer of iron cemented sand at 8.6 ft	SP-SM	90.9		10	S-5, SPT 10+10+13 REC=18", 100%		10.0 ft: switched to 6" O.D. tricone roller bit (mud rotary) and advanced to 83.5 ft, mixed one bag of bentonite with 125 gallons of water to make mud
11.5	9.9 - 11.5 ft: POORLY GRADED SAND, fine to coarse grained sand, subangular to subrounded particles, moist, orangish brown, estimated 5 - 10% fine gravel, no HCl reaction, weak cementation	SP	89.3			UD-2, UNDIST REC=24", 100%	PP = 1.75 tsf PP = 2.00 tsf PP = 2.75 tsf	11.5 - 13.5 ft: Pushed pitcher sample 24", 24" recovery
	11.5 - 17.0 ft: SILTY SAND, medium to coarse grained sand, subrounded to subangular particles, moist, orangish brown, no HCl reaction	SM			15	S-6, SPT 7+11+9 REC=17", 94%		11.5 ft: uniform drilling resistance, smooth drilling
17.0	13.5 ft: Changes to fine to coarse gravel, orangish brown and light gray, estimated <5% fine gravel, 0.25 to 0.5 inch pockets of LEAN CLAY (CL)		83.8			S-7, SPT 6+5+6 REC=14", 78%		
	17.0 - 21.0 ft: SILTY SAND, fine grained sand, moist, light orangish brown, no HCl reaction	SM						

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-779**
Schnabel No.: 06120048
Sheet: 2 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
21.0	21.0 - 23.5 ft: SANDY LEAN CLAY, medium grained sand, moist, orangish brown and light gray, no HCl reaction	SM	79.8					
		CL				UD-3, UNDIST REC=24", 100%	PP = 1.50 tsf PP = 1.00 tsf PP = 1.25 tsf	21.5 - 23.5 ft: Pushed pitcher sample 24", 24" recovery
23.5	23.5 - 27.0 ft: CLAYEY SAND, fine to medium grained sand, moist, orangish brown and light gray, no HCl reaction	SC	77.3		25	S-8, SPT 3+6+6 REC=14", 78%		
27.0	27.0 - 29.1 ft: SANDY LEAN CLAY, medium grained sand, moist, orangish brown and light gray, no HCl reaction, soft	CL	73.8					
29.1	29.1 - 31.5 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, contains mica, no HCl reaction, soft	CL	71.7		30	S-9, SPT 1+3+3 REC=16", 89%		28.5 - 29.1 ft: jar labeled as S-9A 29.0 ft: drilling fluid changes to grayish brown 29.1 - 30.0 ft: jar labeled at S-9B
31.5	31.5 - 33.5 ft: POORLY GRADED SAND, fine grained sand, moist, dark gray, contains mica, no HCl reaction	SP	69.3			UD-4, UNDIST REC=24", 100%	PP = 2.50 tsf PP = 3.00 tsf PP = 2.50 tsf	31.5 ft: Flush hole with drilling fluid to clear cuttings 31.5 - 33.5 ft: Pushed pitcher sample 24", 24" recovery
33.5	33.5 - 41.0 ft: LEAN CLAY, moist, dark gray, contains mica, no HCl reaction, soft, contains a 3.5 inch layer of POORLY GRADED SAND (SP), fine sand, wet, dark gray at 33.5 ft.	CL	67.3		35	S-10, SPT 2+3+5 REC=17", 94%		
	38.5 ft: Changes to firm, contains a 1/8 inch layer of POORLY GRADED SAND (SP) at 39.9 ft				40	S-11, SPT 3+4+5 REC=18", 100%		
41.0	41.0 - 51.0 ft: SILTY SAND, fine grained sand, moist, dark gray, contains mica, no HCl reaction	SM	59.8		45	UD-5, UNDIST REC=24", 100%	PP = 3.25 tsf PP = 4.25 tsf PP = 4.25 tsf	41.5 - 43.5 ft: Pushed pitcher sample 24", 24" recovery 41.5 - 48.5 ft: gray drilling fluid, removed cuttings from mud tub with a shovel
						S-12, SPT 3+7+11 REC=15", 83%		

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-779
Schnabel No.: 06120048
Sheet: 3 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
51.0	51.0 - 53.5 ft: SANDY SILT WITH GRAVEL, fine gravel, moist, olive gray, contains mica, estimated 50 - 100% fine gravel, fine gravel as cemented sand, no HCl reaction (with cemented sand), no HCl reaction (with soil)	SM	49.8		S-13, SPT 5+6+8 REC=18", 100%		
53.5	53.5 - 71.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, no HCl reaction, firm	ML	47.3		UD-6, UNDIST REC=12", 50%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	51.5 - 53.5 ft: Pushed pitcher sample 24", 12" recovery, hard pushing at 52.5 ft, broke through hard material at 53.1 ft, tube not preserved, jar sample taken, (labeled as UD-6)
					UD-7, UNDIST REC=24", 100%		51.5 ft: Increased drilling resistance, rig chatter, slow drilling from 52.5 to 53.1 ft, gray drilling fluid
					S-14, SPT 2+4+4 REC=18", 100%		53.5 ft: Pushed pitcher sample 24", 24" recovery
					S-15, SPT 3+3+3 REC=18", 100%		53.5 - 58.5 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid
					UD-8, UNDIST REC=24", 100%	PP = 3.75 tsf PP = 3.25 tsf PP = 3.50 tsf	61.5 - 63.5 ft: Pushed pitcher sample 24", 24" recovery
					S-16, SPT 3+5+5 REC=18", 100%		
					S-17, SPT 5+5+8 REC=18", 100%		
71.0	71.0 - 77.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, contains fine gravel, contains shell fragments, strong cementation, fine gravel as cemented sand, moderately weathered shell fragments, strong HCl reaction	SM	29.8		UD-9, UNDIST REC=22", 92%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	71.5 ft: Pushed pitcher sample 24", 22" recovery
					S-18, SPT		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
77.0	73.5 ft: Changes to estimated <5% shell fragments, estimated <5% fine gravel, moderate cementation, coarse sand to fine gravel size moderately weathered shell fragments, fine gravel as cemented sand, strong HCl reaction (with shells and cemented sand), weak HCl reaction (with soil)	SM	23.8		75	10+25+50/2" REC=13", 72%		74.0 ft: bit chatter/increased drilling resistance
83.5	77.0 - 83.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, olive gray, contains mica, estimated 5 - 10% shell fragments, moderate cementation, medium sand to fine gravel size fresh to highly weathered shell fragments, fine gravel as sand, strong HCl reaction (with cemented sand), strong HCl reaction (with shells), strong HCl reaction (with soil)	SP-SM			80	S-19, SPT 18+19+19 REC=16", 89%		78.5 - 81.5 ft: Increased drilling resistance, bit chatter at 78.5 ft, broke through hard layer at 85.0 ft
	81.5 ft: Changes to wet, olive brown, contains shell fragments, highly weathered shell fragments, strong HCl reaction (with shells and soil)					UD-10, UNDIST REC=16", 70%	PP = 0.50 tsf PP = 0.75 tsf PP = 0.50 tsf	81.5 - 83.4 ft: Pushed pitcher sample 23", 16" recovery, hard drilling/pushing at 83.1 ft, too hard to push further
87.0	83.5 - 87.0 ft: POORLY GRADED SAND, fine to medium grained sand, moist, olive gray, estimated 5 - 10% shell fragments, coarse sand to fine gravel size shell fragments, strong HCl reaction (with shells and soil)	SP	17.3		85	S-20, SPT 15+20+19 REC=11", 61%		83.5 ft: Switched to 3 1/2" O.D. tricone roller bit (mud rotary) and advanced to 88.5 ft
88.5	87.0 - 88.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, olive gray, estimated <5% shell fragments, coarse sand fine gravel size fresh to moderately weathered shell fragments, weak HCl reaction (with shells and soil)	SP-SM	13.8					87.0 - 87.5 ft: bit chatter, hard/slow drilling to 88.5 ft
	88.5 - 98.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, olive gray, estimated <5% shell fragments, coarse sand size, highly weathered shell fragments, weak HCl reaction (with shells and soil)	SP-SM	12.3		90	S-21, SPT 7+7+11 REC=18", 100%		88.5 ft: Switched to 6" O.D. tricone roller bit and advanced to 100.0 ft
		SP-SM			95	S-22, SPT 4+4+6 REC=17", 94%		
98.5						UD-11, UNDIST REC=14", 58%	PP = 1.00 tsf PP = 1.00 tsf PP = 1.50 tsf	96.5 - 98.5 ft: Pushed pitcher sample 24", 14" recovery resistance increased
100.0	98.5 - 100.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, olive gray, estimated <5% shell fragments, coarse sand size highly weathered shell fragments, weak HCl reaction (with	SP-SM	2.3			S-23, SPT 4+5+8 REC=18", 100%		hard/slow drilling/pushing at 97.5 to 97.8 ft
		SP-SM	0.8		100	UD-12, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf	

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-779**
Schnabel No.: 06120048
Sheet: 5 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
102.0	shells), no HCl reaction (with soil) 100.0 - 102.0 ft: POORLY GRADED SAND WITH SILT, fine gravel, moist, olive gray, contains mica, contains shell fragments, coarse sand size, moderately weathered shell fragments, weak HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-1.2				PP = 4.50 tsf	100.0 - 102.0 ft: Pushed pitcher sample 24", 24" recovery (continued)

Bottom of Boring at 102.0 ft.

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TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-780A**
Schnabel No.: 06120048
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/22/08 Finished: 7/22/08


Easting: 960064 ft Northing: 219540 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 9.7 (ft) Total Depth: 8.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Completion	7/22	---	---	---	8.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
0.0 - 8.0 ft	FILL, sampled as poorly graded sand with silt, fine to coarse grained sand, subangular to angular particles, moist, estimated 5 - 10% fine gravel, no HCl reaction							0.0 - 6.0 ft: Advanced 4 1/4" ID HSA to 8.0 ft. 0 to 6.0 ft: rig chatter to 0.5 ft, augers walking at 0.1 ft. foreman stabilized auger, rig chatter from 5.0 - 6.0 ft.
8.0			1.7			S-1, SS 2+2+4 REC=6", 33%		6.0 - 8.0 ft: Sampler deflected around 7 ft. Rig chatter/grinding from 6.0 7.5 ft, difficult drilling, brown cuttings, few cuttings, augers walking around 7 ft

Bottom of Boring at 8.0 ft.
Boring backfilled with cement/bentonite grout upon completion.
Boring terminated at 8.0 ft



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-780B
Schnabel No.: 06120048
Sheet: 1 of 3

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: T. Chew
Schnabel Representative: B. Glass
Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods
Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit
Hammer Type: Auto Hammer (140 lb)
Dates Started: 7/31/08 **Finished:** 7/31/08
Easting: 960624 ft **Northing:** 219530 ft
Coordinate System: MD State Plane
Ground Surface Elevation: 10± (ft) **Total Depth:** 50.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/31	10:41 AM	10.0'	10.0'	---
Completion	7/31	12:26 PM	5.1'	14.5'	15.4'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.0 - 8.0	See B-780 and B-780A for lithologic description							0.0 ft: advanced 4 1/4" ID HSA to 14.5 ft; changes as noted below see end of boring log for additional remarks 0.0 - 7.5 ft: bit chatter from 0 to 1 ft, auger walking at 0.2 ft; but boring forman stabilized auger, brown cuttings
7.5 - 12.0	POORLY GRADED SAND, medium to coarse grained sand, subangular particles, wet, orangish brown, estimated <5% fine and coarse sand, contains 1 inch layer of SANDY LEAN CLAY (CL), medium sand, moist, brown, soft at 11.3 ft	SP	2.2		5	S-1, SPT 3+3+2 REC=0", 0%		7.5 - 10.0 ft: no recovery due to cohesionless soil, poorly graded sand cuttings, uniform drilling resistance, smooth drilling, brown cuttings
12.0 - 17.0	POORLY GRADED SAND, fine to medium grained sand, wet, gray, estimated 5 - 10% fine gravel, estimated 5 - 10% shell fragments, fine gravel as cemented sands; coarse sand to coarse gravel size moderately to highly weathered shell fragments; strong HCl reaction (with shells and cemented sands), no HCl reaction (with soil), moderate to weak cementation	SP	-1.8		10	S-2, SPT 3+2+2 REC=11", 61%		12.0 - 13.0 ft: bit chatter
17.0 - 22.0	POORLY GRADED SAND, fine grained sand, wet, dark gray, estimated <5% fine gravel, estimated <5% shell fragments, weak cementation, gravel as cemented sands; coarse sand to fine gravel sized highly weathered shell fragments; strong HCl reaction (with shells and	SP	-6.8		15	S-3, SPT 12+6+8 REC=16", 89%		14.5 ft: switched to 3 1/2" OD tricone roller bit (mud rotary) and advanced to 50.0 ft, mixed one bag of bentonite with 125 gallons of water to make drilling fluid 14.5 ft: uniform drilling, smooth drilling, gray drilling fluid
						S-4, SPT 9+9+10 REC=15", 83%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
22.0	cemented sands), no HCl reaction (with soil)	SP	-11.8					
22.0 - 27.5 ft:	POORLY GRADED SAND WITH SILT, moist, olive gray, contains mica, estimated 5 - 10% shell fragments, estimated <5% fine gravel, strong cementation, coarse sand to fine gravel size fresh to highly weathered shell fragments; fine gravel as cemented sands; strong HCl reaction (with shells and cemented sand), weak HCl reaction (with soil), cemented sands are concentrated in sample from 23.5 to 23.9 ft	SP-SM			25	S-5, SPT 17+6+10 REC=17", 94%		
27.5	27.5 - 32.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% fine gravel, estimated 5 - 10% shell fragments, strong HCl reaction, fine gravel as cemented sands; coarse sand to coarse gravel size fresh to highly weathered shell fragments; weak to moderate cementation cemented sands are concentrated in sample from 28.5 to 30.2 ft	SM	-17.3		30	S-6, SPT 27+16+15 REC=18", 100%		28.5 - 33.5 ft: olive gray drilling fluid
32.0	32.0 - 37.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, no HCl reaction	SP-SM	-21.8		35	S-7, SPT 4+7+10 REC=18", 100%		
37.0	37.0 - 42.5 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm	ML	-26.8		40	S-8, SPT 7+9+9 REC=18", 75%		38.5 - 40.0 ft: uniform drilling resistance, smooth drilling
42.5	42.5 - 47.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, weak HCl reaction, coarse sand size fresh shell fragments	SM	-32.3		45	S-9, SPT 7+9+12 REC=18", 100%		

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-780B**
Schnabel No.: 06120048
Sheet: 3 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
47.5	47.5 - 50.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated 15 - 25% shell fragments, medium sand to coarse gravel size fresh to moderately weathered shell fragments; strong HCl reaction (with shells), weak HCl (with soil) Bottom of Boring at 50.0 ft.	SM	-37.3					
50.0		SP-SM	-39.8		50	S-10, SPT 7+8+11 REC=18", 100%		

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
Please refer to original field log for End of Day groundwater observation depths.

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**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-780**
Schnabel No.: 06120048
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/21/08 Finished: 7/21/08

Easting: 960609 ft Northing: 219544 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 9.7 (ft) Total Depth: 6.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Completion	7/21	---	---	6.0'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.0 - 0.5 ft	Topsoil, organics, grass					S-1, SPT 2+17+17 REC=13", 72%		0.0 ft: Advanced 4 1/4" ID HSA to 0.0 to 2.5 ft, augers walking, boring foreman got through at 1.0 ft, rig chatter from 2.0 to 2.5 ft, brown cuttings
0.5	0.5 - 2.0 ft: FILL, sampled as silty sand with gravel, fine to medium grained sand, moist, brown, estimated 30 - 45% rock fragments, no HCl reaction, coarse gravel to cobble size stone, size of rip rap inferred from exposed area 15 ft plant east of boring	FILL	9.2					
2.0	2.0 - 4.0 ft: FILL, sampled as silty gravel with sand, moist, gray, estimated 50 - 100% concrete, no HCl reaction, concrete is rip rap sized	FILL	7.7			S-2, SPT 50/1" REC=1", 83%		2.5 - 5.0 ft: rig chatter, light gray cuttings with pieces of concrete
4.0	4.0 - 6.0 ft: FILL, sampled as sandy silt with gravel, moist, light gray, no HCl reaction, (disintegrated concrete)	FILL	5.7		5	S-3, SPT 50/3" REC=3", 83%		5.0 - 6.0 ft: Rig chatter from 5.0 to 6.0 ft, driller states that the augers are on metal at 6.0 ft
6.0			3.7					

Bottom of Boring at 6.0 ft.

Boring refusal at 6 ft.

Boring backfilled with dry concrete and hydrated with the approval of the contractor



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-781
Schnabel No.: 06120048
Sheet: 1 of 3

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: T. Chew
Schnabel Representative: B. Glass
Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods
Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/21/08 **Finished:** 7/21/08

Easting: 960780.8 ft **Northing:** 219700.9 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 10.4 (ft) **Total Depth:** 50.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ∇	7/21	1:05 PM	10.0'	10.0'	---
Completion ▽	7/21	2:46 PM	5.0'	14.5'	18.7'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.0 - 2.0	FILL, sampled as silty gravel with sand, moist, gray and light brown, estimated 50 - 100% crushed stone, no HCl reaction	FILL	8.4			S-1, SPT 14+20+22 REC=15", 83%		0.0 ft: advanced 4 1/4" ID HSA to 14.5 ft; rig chatter from 0 to 2 ft, gray cuttings changing to brown at 2.2 ft, changes as noted below, see end of boring log for additional remarks
2.0 - 4.5	FILL, sampled as silty sand, medium grained sand, subangular particles, moist, orangish brown and gray, estimated 5 - 10% fine gravel, estimated <5% crushed stone, no HCl reaction	FILL	5.9			S-2, SPT 3+18+11 REC=12", 67%		2.5 - 5.0 ft: uniform drilling resistance, smooth drilling, brown cuttings
4.5 - 9.5	FILL, sampled as clayey sand, medium grained sand, subrounded particles, moist, orangish brown, no HCl reaction	FILL	0.9		5	S-3, SPT 4+5+3 REC=12", 67%		
7.5 ft	Changes to estimated <5% crushed stone	FILL				S-4, SPT 2+2+2 REC=9", 50%		
9.5 - 12.5	FILL, sampled as sandy clay, medium grained sand, wet, orangish brown, no HCl reaction, soft	FILL	-2.1		10	S-5, SPT 1+1+1 REC=4", 22%		10.0 - 13.5 ft: orangish brown cuttings
12.5 - 17.0	POORLY GRADED SAND WITH SILT, medium grained sand, subrounded to subangular particles, wet, dark gray, estimated 5 - 10% shell fragments, strong HCl reaction, fine gravel size fresh shell fragments	SP-SM	-6.6		15	S-6, SPT 1+2+2 REC=11", 61%		12.5 - 14.0 ft: photograph shows incorrect depth should be 13.5 - 15.0 ft
17.0 - 22.0	POORLY GRADED SAND, medium grained sand, subrounded particles, wet, dark gray, estimated <5% shell fragments, coarse sand to fine gravel size fresh to highly weathered shell fragments, strong HCL reaction (with shells), weak HCL reaction (with soil)	SP				S-7, SPT 4+5+6 REC=16", 89%		14.0 ft: cuttings change to gray 14.5 ft: switched to 3 1/2" OD tricone roller bit (mud rotary) and advanced to 50.0 ft. mix one bag of bentonite with 125 gallons of water 14.5 - 18.5 ft: uniform drilling resistance, smooth drilling,

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
22.0	22.0 - 32.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, estimated <5% fine gravel, estimated <5% shell fragments, strong HCl reaction, moderate cementation, fine gravel as cemented sands, coarse sand to fine gravel size moderately to highly weathered shell fragments	SP	-11.6		25	S-8, SPT 8+20+13 REC=18", 100%		gray drilling fluid
27.0	27.0 ft: Changes to highly weathered shell fragments	SP-SM			30	S-9, SPT 5+9+50/4" REC=16", -190%		28.5 - 33.5 ft: uniform drilling resistance, smooth drilling
32.0	32.0 - 37.0 ft: SANDY SILT, fine grained sand, moist, olive gray, no HCl reaction, firm	ML	-21.6		35	S-10, SPT 3+6+8 REC=18", 100%		
37.0	37.0 - 42.0 ft: SILT, moist, olive gray, contains mica, estimated <5% fine grained sand, weak HCl reaction, firm	ML	-26.6		40	S-11, SPT 6+8+9 REC=18", 100%		38.5 - 40.0 ft: uniform drilling resistance, smooth drilling
42.0	42.0 - 47.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size moderately weathered shell fragments, strong HCL reaction (with shells), no HCL reaction (with soil)	SM	-31.6		45	S-12, SPT 4+6+10 REC=18", 100%		

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-781**
Schnabel No.: 06120048
Sheet: 3 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
47.0	47.0 - 50.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated 5 - 10% shell fragments, coarse sand to fine gravel size moderately to highly weathered shell fragments, strong HCL reaction (with shells), no HCL reaction (with soil)	SP-SM	-36.6					
50.0			-39.6		50	S-13, SPT 3+6+9 REC=18", 100%		

Bottom of Boring at 50.0 ft.
Boring backfilled with bentonite upon completion.

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TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-782**
Schnabel No.: 06120048
Sheet: 1 of 3

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/23/08 **Finished:** 7/23/08

Easting: 961232.1 ft **Northing:** 218986.5 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 9.9 (ft) **Total Depth:** 51.5 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	7/23	9:40 AM	8.5'	7.0'	---
Completion ▽	7/23	1:15 PM	5.2'	14.5'	50.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
2.0	0.0 - 2.0 ft: FILL, sampled as silty sand, fine to coarse grained sand, angular to subrounded particles, moist, brownish orange, estimated <5% crushed stone, estimated <5% fine gravel, no HCl reaction	FILL	7.9			S-1, SPT 11+13+13 REC=14", 78%		0.0 ft: advanced 4 1/4" ID HSA to 14.5 ft; at 0.0 to 2.5 ft interval, uniform drilling resistance, smooth drilling, brownish orange cuttings; changes as noted below; see end of boring log for additional remarks
4.5	2.0 - 4.5 ft: FILL, sampled as silty sand, medium grained sand, subangular particles, moist, reddish brown and dark gray, estimated <5% shell fragments, estimated <5% fine gravel, coarse sand size fresh shell fragments; rounded gravel; strong HCl reaction (with shells), no HCl reaction (with soil)	FILL	5.4			S-2, SPT 1+3+4 REC=12", 67%		2.5 - 5.0 ft: brown cuttings
7.0	4.5 - 7.0 ft: FILL, sampled as silty sand, medium to coarse grained sand, subangular particles, moist, brown and dark gray, estimated <5% crushed stone, no HCl reaction, contains a 2 inch layer of poorly graded sand, medium sand, subangular, moist, white at 6.3 ft	FILL	2.9			S-3, SPT 4+10+9 REC=14", 78%		
9.5	7.0 - 9.5 ft: SILTY SAND, medium to coarse grained sand, rounded to subrounded particles, wet, orangish brown, no HCl reaction	SM	0.4			S-4, SPT 2+8+8 REC=13", 72%		
12.5	9.5 - 12.5 ft: POORLY GRADED SAND WITH SILT, medium to coarse grained sand, rounded particles, wet, brownish orange, estimated <5% fine gravel, no HCl reaction, lensed, 0.5 inch pockets of SANDY LEAN CLAY (CL)	SP-SM	-2.6			S-5, SPT 2+2+3 REC=13", 72%		10.0 - 13.5 ft: orangish brown cuttings
17.5	12.5 - 17.5 ft: POORLY GRADED SAND, medium grained sand, subrounded particles, wet, black, estimated <5% shell fragments, coarse sand size fresh shell fragments; strong HCl reaction (with shells), no HCl reaction (with soil)	SP				S-6, SPT 2+5+3 REC=13", 72%		13.5 - 14.5 ft: brown cuttings
	17.5 - 22.0 ft: POORLY GRADED	SP-SM	-7.6					14.5 ft: switch to 3 1/2" OD tricone roller bit (mud rotary and advanced to 50.0 ft. Mix 125 gallons of water with one bag of bentonite to make drilling fluid

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	SAND WITH SILT, fine to medium grained sand, wet, gray, estimated 5 - 10% fine gravel, estimated 5 - 10% shell fragments, strong HCl reaction, strong cementation, fine gravel as cemented sands; coarse sand to fine gravel size fresh shell fragments	SP-SM			20	S-7, SPT 15+11+7 REC=16", 89%		14.5 - 18.5 ft: bit chatter at 17.5 ft, gray drilling fluid (continued)
22.0	22.0 - 32.0 ft: POORLY GRADED SAND WITH SILT, moist, olive gray, contains mica, estimated <5% shell fragments, fine gravel size highly weathered shell fragments; strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-12.1		25	S-8, SPT 3+5+8 REC=17", 94%		
						UD-1, UNDIST REC=0", 0%		26.5 ft: Shelby tube push attempted; tube did not penetrate the soil, no sample recovered, no jar sample taken, tube not preserved
					30	S-9, SPT 4+6+9 REC=18", 100%		28.5 - 33.5 ft: greenish gray drilling fluid
32.0	32.0 - 37.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size fresh to highly weathered shell fragments; contains a 9-inch layer of fine gravel (as cemented sands); strong HCl reaction (with shells), weak HCl reaction (with soil); moderate to strong cementation	SM	-22.1		35	S-10, SPT 24+10+13 REC=18", 100%		
37.0	37.0 - 42.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-27.1		40	S-11, SPT 5+7+10 REC=18", 100%		38.5 - 43.5 ft: uniform drilling resistance, smooth drilling, greenish gray drilling fluid
42.0		ML	-32.1					

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-782**
Schnabel No.: 06120048
Sheet: 3 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	42.0 - 46.5 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	ML			45	S-12, SPT 6+8+9 REC=18", 100%		
46.5	46.5 - 47.3 ft: SILTY SAND, fine grained sand, moist, olive green, contains mica, no HCl reaction	SM	-36.6			UD-2, UNDIST REC=9", 94%	PP = 4.50 tsf PP = 4.00 tsf PP = 4.40 tsf	46.5 - 47.3 ft: pushed shelby tube 9" recovery
47.3	47.3 - 51.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive green, contains mica, estimated <5% shell fragments, fine gravel size moderately weathered shell fragments; strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-37.4			S-13, SPT 4+8+12 REC=18", 100%		
	50.0 ft: Changes to fine gravel size fresh to moderately weathered shell fragments; strong HCl reaction (with shells), weak HCl reaction (with soil)				50	S-14, SPT 4+7+9 REC=18", 100%		
51.5			-41.6					

Bottom of Boring at 51.5 ft.

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

Please refer to original field log for End of Day groundwater observation depths.



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-787**
Schnabel No.: 06120048
Sheet: 1 of 5

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: T. Chew
Schnabel Representative: B. Glass
Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods
Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit
Hammer Type: Auto Hammer (140 lb)
Dates Started: 8/1/08 **Finished:** 8/4/08
Easting: 960596 ft **Northing:** 217782 ft
Coordinate System: MD State Plane
Ground Surface Elevation: 50± (ft) **Total Depth:** 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	8/1	10:30 AM	18.5'	18.5'	---
Start of Day	8/4	8:10 AM	17.5'	19.5'	---
Completion	8/4	9:25 AM	5.1'	19.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.0 - 2.0	FILL, sampled as silty sand, fine to medium grained sand, moist, orangish brown with mottles of light gray, no HCl reaction	FILL	47.9			S-1, SPT 1+4+3 REC=13", 72%		0.0 ft: advanced 4 1/4" ID HSA to 19.5 ft
2.0 - 4.5	FILL, sampled as clayey sand, fine to medium grained sand, moist, orangish brown with mottles of light gray, no HCl reaction	FILL	45.4			S-2, SPT 2+3+4 REC=13", 72%		0.0 - 2.5 ft: uniform resistance, smooth drilling, brown cuttings, changes as noted below, see end of boring logs for additional remarks
4.5 - 7.0	FILL, sampled as sandy lean clay, fine grained sand, moist, orangish brown with mottles of gray, no HCl reaction	FILL	42.9		5	S-3, SPT 1+2+3 REC=10", 56%		
7.0 - 9.5	FILL, sampled as silty sand, fine to medium grained sand, moist, brown with mottles of gray, estimated <5% crushed stone, no HCl reaction, contains 1 inch layer of Lean Clay (CL) at 8.4 ft	FILL	40.4		10	S-4, SPT 1+3+5 REC=13", 72%		
9.5 - 14.2	FILL, sampled as poorly graded sand, fine to medium grained sand, moist, orangish brown with bands of light gray, estimated <5% fine gravel, no HCl reaction, moderate cementation, fine gravel as cemented sands	FILL	35.7		15	S-5, SPT 3+6+7 REC=17", 94%		
14.2 - 17.5	FILL, sampled as sandy lean clay, fine grained sand, moist, gray, estimated <5% crushed stone, estimated <5% fine gravel, contains 0.25 inch layer of iron cemented sands at 14.8 ft	FILL	32.4			S-6, SPT 2+2+3 REC=18", 100%		13.5 - 14.2 ft: jar labeled as S-6A 14.2 - 15.0 ft: jar labeled as S-6B
17.5 - 22.5	POORLY GRADED SAND, medium grained sand, subrounded particles, wet, brown with bands of brownish red, estimated <5% fine gravel, no HCl reaction, weak cementation, fine gravel as iron	SP				S-7, SPT 2+4+5 REC=17", 94%		19.5 ft: switched

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
22.5	cemented sands	SP	27.4					to 3 1/2" OD tricone roller bit (mud rotary) and advanced to 100 ft; mixed one bag of bentonite with 125 gallons of water to make drilling fluid
22.5 - 27.5 ft:	SANDY SILT, fine grained sand, moist, dark gray, estimated <5% shell fragments, contains mica, coarse sand size highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	ML			25	S-8, SPT 3+4+5 REC=18", 100%		19.5 - 23.5 ft: uniform drilling resistance, smooth drilling, grayish brown drilling fluid (continued)
27.5	27.5 - 32.0 ft: SILTY SAND, fine grained sand, moist, dark gray, contains mica, estimated <5% shell fragments, estimated <5% fine gravel, moderate cementation, coarse sand sized moderate to highly weathered shell fragments, fine gravel as cemented sands, strong HCl reaction (with cemented sands), weak HCl reaction (with shells), no HCl reaction (with soil)	SM	22.4		30	S-9, SPT 3+4+9 REC=18", 100%		23.5 - 28.5 ft: gray drilling fluid
32.0	32.0 - 37.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, dark gray, contains mica, estimated 5-10% fine gravel, estimated <5% shell fragments, strong cementation, fine gravel as cemented sands, fresh to highly weathered shell fragments, strong HCl reaction (with cemented sands, shells and soil)	SP-SM	17.9		35	S-10, SPT 13+14+10 REC=18", 100%		
37.5	37.5 - 52.0 ft: POORLY GRADED SAND, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, coarse sand sized moderately weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SP	12.4		40	S-11, SPT 4+5+8 REC=17", 94%		
43.5 ft:	Changes to coarse sand to fine gravel sized fresh shell fragments	SP			45	S-12, SPT 4+5+6 REC=18", 100%		42.0 - 43.0 ft: bit chatter
								43.5 - 48.5 ft: uniform drilling resistance, smooth drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	48.5 ft: Changes to coarse sand sized highly weathered shell fragments, weak HCl reaction (with shells)	SP			50	S-13, SPT 4+5+6 REC=18", 100%		
52.0	52.0 - 57.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel sized highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-2.1		55	S-14, SPT 3+5+6 REC=18", 100%		53.5 - 58.5 ft: bit chatter
57.0	57.0 - 62.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated 15 - 25% fine gravel, estimated 5 - 10% shell fragments, strong HCl reaction, strong cementation, fine gravel as cemented sands, coarse sand to fine gravel size fresh to highly weathered shell fragments	SP-SM	-7.1		60	S-15, SPT 26+16+8 REC=18", 100%		59.5 - 62.5 ft: intermittent bit chatter
62.5	62.5 - 67.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated 5 - 10% fine gravel, moderate to strong cementation, fine gravel as cemented sands, strong HCl reaction (with cemented sands and soil)	SP-SM	-12.6		65	S-16, SPT 50/2" REC=2", 83%		
67.0	67.0 - 72.5 ft: POORLY GRADED SAND, fine grained sand, wet, olive gray, contains mica, estimated <5% shell fragments, strong cementation, fine gravel sized highly weathered shell fragments, contains a 2 inch layer of fine gravel as cemented sand at 69.6 ft, strong HCl reaction (with cemented sands and shells), no HCl reaction (with soil)	SP	-17.1		70	S-17, SPT 6+12+50/4" REC=16", 103%		67.0 - 70.5 ft: bit chatter
72.5	72.5 - 77.5 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell	ML	-22.6			S-18, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	fragments, firm, coarse sand to fine gravel sized moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	ML			75	8+9+15 REC=18", 100%		73.5 - 78.5 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid (continued)
77.5	77.5 - 82.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand size highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-27.6		80	S-19, SPT 5+9+14 REC=18", 100%		
82.5	82.5 - 87.5 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm	ML	-32.6		85	S-20, SPT 9+10+12 REC=18", 100%		
87.5	87.5 - 92.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-37.6		90	S-21, SPT 7+10+16 REC=18", 100%		88.5 - 93.0 ft: flushed boring with water
92.5	92.5 - 97.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated 5 - 10% shell fragments, coarse sand to fine gravel sized fresh to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-42.6		95	S-22, SPT 7+11+12 REC=18", 100%		
97.5	97.5 - 100.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, weak HCl reaction, coarse sand sized highly weathered shell fragments	SM	-47.6			S-23, SPT 8+11+15 REC=18", 100%		
100.0			-50.1		100			

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-787**
Schnabel No.: 06120048
Sheet: 5 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	Bottom of Boring at 100.0 ft. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.							
DRAFT								

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-788**
Schnabel No.: 06120048
Sheet: 1 of 3

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 6/27/08 Finished: 6/27/08

Easting: 960881.3 ft Northing: 217507.3 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 51.3 (ft) Total Depth: 50.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	6/27	9:52 AM	18.5'	10.0'	---
Completion	6/27	11:00 AM	2.5'	10.0'	49.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
0.0 - 2.0	SANDY LEAN CLAY, fine grained sand, moist, brown, no HCl reaction	CL				S-1, SPT 1+3+4 REC=16", 89%		0.0 - 2.5 ft: Advanced 4 1/4" ID HSA to 10.0 ft.
2.0			49.3					0.0 to 2.5 ft: Uniform drilling resistance, brown cuttings, changes as noted below. see end of boring log for additional remarks
2.0 - 3.5	CLAYEY SAND, fine to medium grained sand, moist, light gray with mottles of orangish brown, no HCl reaction, moderate cementation, iron oxidation mottles	SC				S-2, SPT 3+5+5 REC=18", 100%		1.5 - 15.7 ft: Labeled as S-7A
3.5			47.8					2.5 - 3.5 ft: Jar labeled as S-2A
3.5 - 7.0	LEAN CLAY, moist, light gray with bands of orangish brown, estimated <5% fine grained sand, no HCl reaction, soft, iron oxidation bands	CL			5	S-3, SPT 2+4+5 REC=18", 100%		3.5 - 4.0 ft: Jar labeled as S-2B
7.0			44.3			S-4, SPT 3+5+6 REC=18", 100%		5.0 - 7.5 ft: orangish gray cuttings
7.0 - 9.0	LEAN CLAY, moist, light gray with bands of orangish brown, no HCl, moderate cementation reaction, contains a 0.25 inch layer of cemented sands at 7.9 and 8.3 ft; iron oxidation mottles	CL						
9.0			42.3					
9.0 - 14.5	8.7 ft: Changes to gray POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, dark gray, contains mica, no HCl reaction, moderate cementation, contains a 0.25 inch layer of cemented reddish fine sand at 10.1 ft	SP-SM			10	S-5, SPT 6+6+9 REC=18", 100%		10.0 - 12.5 ft: Switched to 3 1/2" OD Tricone roller bit and advanced to 50.0 ft
14.5			36.8			S-6, SPT 3+8+15 REC=17", 94%		10.0 ft: Uniform drilling resistance, smooth drilling, dark gray drilling fluid; changed to brown from 11.5 to 12 ft and back to dark gray.
14.5 - 15.7	SILTY SAND, fine grained sand, moist, dark gray, contains mica, no HCl reaction, moderate cementation, contains a 1 inch layer of fine cemented sands at 15.6 ft, brownish red, moderate cementation.	SM			15	S-7, SPT 8+10+16 REC=12", 67%		12.5 - 15.0 ft: dark gray drilling fluid
15.7			35.6					15.0 - 18.0 ft: gray drilling fluid
15.7 - 26.5	POORLY GRADED SAND, fine to medium grained sand, moist, light gray and brownish red, no HCl reaction, moderate cementation, contains interbeds of cemented fine sands, brownish red	SP				S-8, SPT 8+10+16 REC=13", 72%		15.7 - 16.5 ft: Labeled as jar S-7B
18.5	Changes to wet, dark gray,							

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	estimated <5% silt						
		SP					
	23.5 ft: Changes to estimated <5% shell fragments, weak HCl reaction (with shells)				S-9, SPT 36+50/5" REC=11", 102%		
26.5			24.8				
	26.5 - 32.0 ft: SILTY SAND, fine grained sand, moist, dark gray, estimated <5% shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM			S-10, SPT 4+5+6 REC=18", 100%		
32.0			19.3				32.0 ft: Bit chatter
	32.0 - 36.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, dark gray, estimated 50 - 100% cemented sands, weak HCl reaction, fine to medium cemented sands, strong cementation	SP-SM			S-11, SPT 50/4" REC=3", 83%		33.5 - 38.5 ft: Uniform drilling resistance, smooth drilling, gray drilling fluid
36.0			15.3				
	36.0 - 50.0 ft: POORLY GRADED SAND, fine grained sand, wet, gray, estimated <5% silt, estimated 5 - 10% shell fragments, no HCl reaction				S-12, SPT 18+7+6		38.5 - 43.5 ft: Uniform drilling resistance, smooth drilling, gray drilling fluid
		SP					
	43.5 ft: Changes to fine to medium grained sand, subrounded particles, dark gray, estimated <5% silt, estimated <5% shell fragments, weak HCl reaction (with shells)				S-13, SPT 6+9+9 REC=17", 94%		

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-788**
Schnabel No.: 06120048
Sheet: 3 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
50.0		SP	1.3		50	S-14, SPT 3+5+7 REC=16", 89%		

Bottom of Boring at 50.0 ft.

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

DRAFT

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-789
Schnabel No.: 06120048
Sheet: 1 of 6

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 6/26/08 **Finished:** 6/26/08

Easting: 961000 ft **Northing:** 217388.6 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 56± (ft) **Total Depth:** 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	6/26	10:24 AM	23.5'	10.0'	---
Completion	6/26	4:39 PM	11.5'	10.0'	76.5'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
0.5	0.0 - 0.5 ft: Topsoil, contains organics, contains roots	SM	55.8			S-1, SPT 1+1+2 REC=18", 100%		0.0 ft: Advanced 4 1/4" ID HSA to 10.0 ft, 0.0 to 2.5 ft: uniform drilling resistance, smooth drilling, orangish brown cuttings. changes as noted below.
2.0	0.5 - 2.0 ft: SILTY SAND, fine to medium grained sand, moist, light brown with mottles of orangish brown, contains roots, contains fine gravel, no HCl reaction		54.3			S-2, SPT 1+2+4 REC=18", 100%		
4.5	2.0 - 4.5 ft: LEAN CLAY, moist, light gray with mottles of orangish red, contains fine to medium sand, no HCl reaction, soft, iron oxidation mottles	CL	51.8					5.0 - 7.5 ft: orangish brown cuttings
	4.5 - 7.0 ft: SANDY LEAN CLAY, fine grained sand, moist, light gray with bands of reddish orange, contains roots, no HCl reaction, soft, iron oxidation bands	CL	49.3		5	S-3, SPT 3+3+4 REC=8", 44%		
7.0	7.0 - 9.5 ft: LEAN CLAY, moist, light gray with bands of reddish orange, estimated <5% fine grained sand, no HCl reaction, soft, iron oxidation bands	CL	46.8			S-4, SPT 2+2+5 REC=18", 100%		7.5 - 10.0 ft: increased drilling resistance at 9.0 ft, smooth drilling, brownish orange cuttings
9.5	9.5 - 12.0 ft: LEAN CLAY, moist, dark gray, contains mica, no HCl reaction, firm	CL	44.3		10	S-5, SPT 4+5+8 REC=18", 100%		
12.0	12.0 - 14.5 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, contains mica, no HCl reaction, firm	CL	41.8			S-6, SPT 4+6+6 REC=18", 100%		10.0 - 12.5 ft: Switched to 3 1/2" O.D. tricone roller bit (mud rotary) and advanced to 98.5 ft: smooth drilling, gray drilling fluid, mud thinner added at 12.5 ft.
14.5	14.5 - 19.7 ft: CLAYEY SAND, fine	SC						

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04 22 GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	grained sand, moist, dark gray, contains mica, no HCl reaction	SC			S-7, SPT 2+3+6 REC=18", 100%		
19.7	19.7 - 22.0 ft: SILTY SAND, fine to medium grained sand, moist, gray with bands of orange, iron oxidation bands, contains a 0.5 inch layer of iron cemented sands at 19.7 ft, no HCl reaction	SM	36.6		S-8, SPT 3+3+7 REC=18", 100%		18.5 - 19.7 ft: Jar sampled as S-8A
22.0	22.0 - 27.0 ft: POORLY GRADED SAND, fine to medium grained sand, wet, light brown, estimated <5% silt, no HCl reaction	SP	34.3		S-9, SPT 13+16+23 REC=13", 72%		19.7 - 20.0 ft: Jar labeled as S-8B 20.0 ft: grayish brown drilling fluid
27.0	27.0 - 32.0 ft: POORLY GRADED SAND, medium to coarse grained sand, subrounded particles, wet, dark gray, estimated <5% silt, no HCl reaction, contains 0.5 inch layers of LEAN CLAY (CL)	SP	29.3		S-10, SPT 1+2+1 REC=14", 78%		28.5 - 33.5 ft: increased drilling resistance at 33 ft, gray drilling fluid
32.0	32.0 - 37.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, contains mica, estimated <5% shell fragments, strong HCl reaction (with shells and soil)	SP-SM	24.3		S-11, SPT 3+3+5 REC=18", 100%		33.5 - 38.5 ft: rig chatter from 37.0 ft to 38.0 ft

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-789
Schnabel No.: 06120048
Sheet: 3 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
37.0	37.0 - 41.0 ft: SILTY SAND, fine grained sand, wet, dark gray, contains cemented sands, no HCl reaction, strong cementation	SP-SM	19.3					33.5 - 38.5 ft: rig chatter from 37.0 ft to 38.0 ft (continued)
41.0	41.0 - 47.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated 15 - 25% shell fragments, weak HCl reaction (with shells and soil)	SM	15.3		40	S-12, SPT 50/5" REC=4", 83%		38.5 - 43.5 ft: drilling resistance increasing and decreasing intermittently
47.0	47.0 - 57.0 ft: POORLY GRADED SAND, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, estimated <5% silt, strong HCl reaction (with shells and soil)	SP-SM	9.3		45	S-13, SPT 33+13+9 REC=18", 100%		
		SP			50	S-14, SPT 7+8+12 REC=18", 100%		48.5 - 53.5 ft: Advanced tricone bit: uniform drilling resistance, smooth drilling, gray fluid
	53.5 ft: Changes to fine to medium grained sand, subrounded particles, strong HCl reaction (with shells), weak HCl reaction (with soil)				55	S-15, SPT 5+6+9 REC=18", 100%		

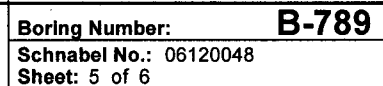
(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
57.0	57.0 - 67.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, no HCl reaction	SP	-0.7					
					60	S-16, SPT 4+5+8 REC=18", 100%		58.5 - 60.0 ft: Advanced tricone bit: uniform drilling resistance, smooth drilling, gray drilling fluid
	63.5 ft: Changes to estimated <5% shell fragments, weak HCl reaction (with shells and soil)	SP-SM			65	S-17, SPT 4+5+7 REC=18", 100%		63.5 - 68.5 ft: rig chatter at 67.5 ft
67.5	67.5 - 72.0 ft: SILTY SAND, fine grained sand, wet, light gray, contains cemented sands, estimated 15 - 25% shell fragments, strong cementation, strong HCl reaction (with shells and soil)	SM	-11.2		70	S-18, SPT 16+22+50/5" REC=16", 95%		68.5 - 73.5 ft: intermittent rig chatter, gray drilling fluid
72.0	72.0 - 87.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated <5% shell fragments, strong HCl reaction (with shells) weak HCl reaction (with soil)	SP-SM	-15.7		75	S-19, SPT 14+14+27 REC=18", 100%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-789**
Schnabel No.: 06120048
Sheet: 6 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
100.0	98.5 ft: Changes to strong HCl reaction (with shells and soil)	SM	43.7		100	S-24, SPT 7+8+10 REC=18", 100%		93.5 - 98.5 ft: Advanced tricone bit: uniform drilling resistance, smooth drilling, gray drilling fluid (continued)

Bottom of Boring at 100.0 ft.
Boring backfilled with cement/bentonite grout upon completion.

DRAFT



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-790
Schnabel No.: 06120048
Sheet: 1 of 3

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: T. Chew
Schnabel Representative: B. Glass
Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods
Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 6/30/08 **Finished:** 7/1/08

Easting: 961110.5 ft **Northing:** 217278.1 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 72.7 (ft) **Total Depth:** 49.7 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	6/30	5:22 PM	19.3'	19.5'	---
Start of Day	7/1	6:55 AM	25.1'	14.5'	---
Completion	7/1	7:22 AM	35.0'	14.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.2	0.0 - 0.2 ft: Asphalt	GW	72.5					0.0 ft: Advanced 4-1/4" ID HSA to 14.5 ft. 0.0 to 2.5 ft: uniform drilling resistance
0.6	0.2 - 0.6 ft: GRAVEL		72.1					smooth drilling, brownish, orange cuttings, changes as noted below, see end of boring log for additional remarks
	0.6 - 4.5 ft: SILTY SAND, fine and coarse grained sand, subangular particles, moist, orangish brown, no HCl reaction	SM				S-1, SPT 5+5+5 REC=17", 94%		
	2.5 ft: Changes to subrounded particles, light gray and brownish orange					S-2, SPT 4+3+3 REC=10", 56%		
4.5	4.5 - 7.0 ft: POORLY GRADED SAND, medium to coarse grained sand, subrounded particles, moist, brownish orange, estimated <5% fine to coarse gravel, no HCl reaction, subrounded gravel, contains a 0.25 inch layer of LEAN CLAY (CL), moist, light gray at 5.9 ft	SP	68.2	5		S-3, SPT 4+3+3 REC=13", 72%		2.5 - 5.0 ft: orangish brown cuttings
7.0	7.0 - 9.5 ft: POORLY GRADED SAND, fine to coarse grained sand, subrounded particles, moist, orangish brown, contains roots, estimated 5 - 10% fine to coarse gravel, no HCl reaction, subrounded gravel	SP	65.7			S-4, SPT 32+13+4 REC=4", 22%		5.0 - 7.5 ft: brownish orange cuttings
9.5	9.5 - 12.5 ft: LEAN CLAY WITH SAND, fine grained sand, moist, brownish orange and light gray	CL	63.2	10		S-5, SPT 2+5+6 REC=11", 61%		7.5 - 10.0 ft: orangish brown cuttings
12.5	12.5 - 22.0 ft: LEAN CLAY, moist, light gray with bands of brownish orange, estimated <5% fine grained sand, contains roots, no HCl reaction, firm, iron oxidation bands, 2 inch layer of POORLY GRADED SAND WITH SILT(SP-SM) wet, fine sand, wet dark gray at 19.3 ft	CL	60.2			S-6, SPT 2+4+4 REC=14", 78%		10.0 - 13.5 ft: brownish orange cuttings
					15	S-7, SPT 3+6+6 REC=18", 100%		14.5 ft: switched to 3-1/2" OD tricone roller bit (mud rotary) and advanced to 48.5 ft. 2 bags of bentonite mixed with 124 gallons of water
								14.5 ft: uniform drilling resistance, smooth drilling, brown drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
22.0	22.0 - 27.0 ft: LEAN CLAY, moist, dark gray, contains mica, no HCl reaction, firm	CL	50.7					18.5 - 23.5 ft: brownish gray drilling fluid (continued)
		CL			25	S-8, SPT 4+8+10 REC=18", 100%		23.5 - 28.5 ft: increased drilling resistance with depth, no distinct increase at a particular depth, gray drilling fluid
27.0	27.0 - 32.0 ft: CLAYEY SAND, fine grained sand, moist, dark gray, contains mica, no HCl reaction	SC	45.7		30	S-9, SPT 6+11+15 REC=18", 100%		
32.0	32.0 - 37.0 ft: POORLY GRADED SAND, fine grained sand, wet, brown, estimated <5% shell fragments, medium sand size shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SP	40.7		35	S-10, SPT 6+19+20 REC=13", 72%		33.5 - 38.5 ft: uniform drilling resistance, smooth drilling
37.0	37.0 - 42.0 ft: POORLY GRADED SAND, fine grained sand, wet, dark gray, estimated <5% silt, no HCl reaction	SP	35.7		40	S-11, SPT 6+10+9 REC=12", 67%		38.5 - 43.5 ft: No photograph taken of S-11 due to heavy rains
42.0	42.0 - 47.0 ft: POORLY GRADED SAND, fine to medium grained sand, wet, dark gray, no HCl reaction	SP	30.7		45	S-12, SPT 1/12+1" REC=7", 39%		43.5 - 45.0 ft: loss of 125 gallons of drilling fluid 45.0 ft: Mix 1 bag of bentonite with 100 gallons of water

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-790**

Schnabel No.: 06120048

Sheet: 3 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV. (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
47.0	47.0 - 49.7 ft: SILTY SAND, fine grained sand, moist, dark gray, contains mica, weak HCl reaction	SM	25.7					45.0 - 48.5 ft: uniform drilling resistance, loss of about 70 gallons of drilling fluid (<i>continued</i>)
49.7			23.0			S-13, SPT 6+8+50/2" REC=14", 97%		

Bottom of Boring at 49.7 ft.

Boring backfilled with betonite and cement grout using tremie upon completion.

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TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-791
Schnabel No.: 06120048
Sheet: 1 of 8

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: K. Bell

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 6/23/08 **Finished:** 6/24/08

Easting: 961245.1 ft **Northing:** 217143.5 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 84.5 (ft) **Total Depth:** 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	6/23	---	15.0'	15.0'	---
Start of Day	6/24	8:30 AM	14.5'	19.0'	---
Completion	6/24	4:50 PM	15.1'	19.0'	26.4'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.0 - 4.5	0.0 - 4.5 ft: FILL, sampled as silty sand, coarse grained sand, rounded particles, moist, brown and yellowish brown, estimated <5% fine gravel, estimated <5% roots, no HCl reaction, small roots 0-0.4 ft	FILL	80.0	A	S-1, SPT 1+5+6 REC=16", 89%			0.0 ft: Advanced 4-1/4" I.D. HSA to 19.0 ft. 0.0 to 2.5 ft: uniform drilling resistance, changes as noted below. see end of boring log for additional remarks
4.5 - 7.0	2.6 ft: Changes to fine to medium grained sand, yellowish brown, no HCl reaction, subrounded gravel, contains 0.15 ft layer of silty sand, moist, dark brown mottled with grayish brown, fine gravel crumble 4.5 - 7.0 ft: PROBABLE FILL, sampled as silty sand, fine to coarse grained sand, moist, orangish brown, estimated <5% fine gravel, no HCl reaction, dark brown at 5.5 ft, changes to yellowish brown at 5.9 ft, subrounded gravel, contains very thin layer of pine bark at 5.5 ft, increased fines with depth stepped at 5.5 ft and 5.9 ft	FILL	77.5	B2	S-2, SPT 1+2+1 REC=14", 78% S-3, SPT 1+2+4 REC=17", 94%			2.6 - 5.0 ft: slight bit resistance (possible gravel), replaced split barrel sampler shoe 5.0 - 7.5 ft: slight bit resistance (possible gravel), changed to a new shoe for spoon
7.0 - 17.5	7.0 - 17.5 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, subrounded to subangular particles, moist, light brown, estimated <5% fine gravel, no HCl reaction, subangular gravel	SP-SM			S-4, SPT 3+3+3 REC=15", 83%			7.5 - 10.0 ft: uniform drilling resistance

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
					S-5, SPT 3+5+6 REC=17", 94%		10.0 - 12.5 ft: easy drilling
	12.5 ft: Changes to fine to medium grained sand, subrounded to subangular particles, light brown, no HCl reaction	SP-SM		B2	S-6, SPT 5+7+8 REC=17", 94%		12.5 - 15.0 ft: Hammer Energy test performed
	15.0 ft: Changes to wet, orangish brown, no HCl reaction				S-7, SPT 3+5+4 REC=15", 83%		15.0 - 19.0 ft: Switched to 3-1/2" O.D. Tricone Roller bit (mud rotary) and advanced to 98.5 ft
17.5	17.5 - 22.5 ft: SILTY SAND, fine to coarse grained sand, subrounded to subangular particles, wet, yellowish brown, estimated <5% fine gravel, no HCl reaction, subrounded gravel, contains 5" layer of LEAN CLAY WITH SAND (CL), moist, gray at 19.4 ft	SM	67.0		S-8, SPT 3+4+6 REC=15", 83%		19.0 - 23.5 ft: uniform drilling resistance
22.5	22.5 - 28.5 ft: SILTY SAND, fine to medium grained sand, wet, yellowish brown, estimated <5% fine gravel, no HCl reaction, angular to subangular gravel, gravels increase with depth	SM	62.0				

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-791**
Schnabel No.: 06120048
Sheet: 3 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
						S-9, SPT 4+14+18 REC=18", 100%		23.5 - 28.5 ft: Slight drilling resistance at 24.0 ft, (possible gravel), clay cuttings. Hammer Energy test performed
		SM			25			
28.5	28.5 - 42.0 ft: LEAN CLAY, moist, light gray, estimated <5% medium grained sand, contains mica, firm, homogeneous structure		56.0			S-10, SPT 3+4+5 REC=18", 100%		28.5 - 33.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid at 33.5 ft
					30			
		CL						
	33.5 ft: Changes to estimated <5% fine grained sand, contains mica, firm, homogeneous structure					S-11, SPT 4+4+6 REC=18", 100%		33.5 - 38.5 ft: easy drilling
					35			

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04 22.GDT 8/27/08

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
51.5	51.5 - 61.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, light gray, contains mica, no HCl reaction, homogeneous structure	SP-SM	33.0					48.5 - 53.5 ft: slower drilling rate, intermittent drilling resistance (continued)
						S-15, SPT 32+57+100/3" REC=9", 94%		53.5 - 58.5 ft: uniform drilling resistance, Hammer Energy test performed
					55			
		SP-SM						
						S-16, SPT 50/5" REC=5", 104%		58.5 - 63.5 ft: slight rig chatter from 62.0 to 63.5 ft, (possible gravel)
					60			
61.0	61.0 - 66.0 ft: SANDY SILT, moist, light gray, contains mica, no HCl reaction, soft, strong cementation (tip of SPT shoe)		23.5					
		ML						
						S-17, SPT 50/2"		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
		ML			65	REC=2", 83%		63.5 - 68.5 ft: intermittent drilling resistance (continued)
66.0	66.0 - 71.5 ft: SILTY SAND, fine to medium grained sand, wet, light gray, estimated <5% shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil), shell size increase with depth	SM	18.5					
					70	S-18, SPT 50/5" REC=5", 104%		68.5 - 73.5 ft: moderate resistance from 68.5 to 71.5; no resistance from 71.5 to 73.5. Hammer Energy test performed
71.5	71.5 - 82.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	13.0					
					75	S-19, SPT 7+5+8 REC=18", 100%		73.5 - 78.5 ft: slight drilling resistance at 77.5 ft. (possible shells) Hammer Energy test performed

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-791
Schnabel No.: 06120048
Sheet: 7 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	78.5 ft: Changes to light gray and greenish gray, estimated <5% shell fragments, weak HCl reaction (with shells)	SP-SM				S-20, SPT 8+9+9 REC=18", 100%		78.5 - 83.5 ft: uniform drilling resistance, smooth drilling.
82.0	82.0 - 87.0 ft: SANDY LEAN CLAY, fine grained sand, wet, greenish gray, no HCl reaction, firm, homogeneous structure	CL	2.5			S-21, SPT 6+6+9 REC=17", 94%		83.5 - 88.5 ft: uniform drilling resistance, smooth drilling, Hammer Energy test performed
87.0	87.0 - 92.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray and greenish gray, estimated <5% shell fragments, no HCl reaction(both shells and soil)	SP-SM	-2.5			S-22, SPT 5+5+6 REC=18", 100%		88.5 - 93.5 ft: uniform drilling resistance, easy drilling.

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
92.0	92.0 - 98.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray and white, estimated <5% shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil), moderate to strong cementation	SP-SM	-7.5					88.5 - 93.5 ft: uniform drilling resistance, easy drilling. (continued)
						S-23, SPT 50/6" REC=6", 100%		93.5 - 98.5 ft: slight drilling resistance from 93.5 to 94, drillers added water to the mud at 98.5 ft, Hammer Energy test performed
98.5	98.5 - 100.0 ft: POORLY GRADED SAND WITH SILT, wet, gray, estimated <5% shells, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-14.0					
						S-24, SPT 9+13+14 REC=18", 100%		
100.0			-15.5		100			

Bottom of Boring at 100.0 ft.

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-821**
Schnabel No.: 06120048
Sheet: 1 of 3

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: T. Chew
Schnabel Representative: B. Glass
Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods
Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)
Dates Started: 7/17/08 **Finished:** 7/17/08
Easting: 961124.6 ft **Northing:** 218736.3 ft **By:** Land Survey
Coordinate System: MD State Plane
Ground Surface Elevation: 8.9 (ft) **Total Depth:** 50.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/17	12:00 AM	7.5'	7.5'	---
Completion	7/17	4:30 PM	12.5'	7.5'	19.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.0 - 2.5	FILL, sampled as silty gravel, fine to coarse grained sand, angular particles, moist, light gray, no HCl reaction, stone base	FILL	6.4		5	S-1, SPT 21+32+27 REC=18", 100%		0.0 - 2.5 ft: advanced 4 1/4" ID HSA to 9.0 ft; from 0 to 2.5 ft, rig chatter throughout drilling interval, light gray cuttings; changes as noted below, see end of boring for additional remarks
2.5 - 4.5	FILL, sampled as sandy sand, medium to coarse grained sand, subangular particles, moist, brown and gray, estimated <5% fine gravel, estimated <5% shell fragments, estimated <5% crushed stone, fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	FILL	4.4		5	S-2, SPT 27+13+16 REC=18", 100%		2.5 - 5.0 ft: rig chatter to 2.8 ft (crushed stone base possibly ends at 2.8 ft), brown cuttings
4.5 - 9.5	POORLY GRADED SAND WITH SILT, medium grained sand, subangular particles, wet, dark gray, estimated 15 - 25% shell fragments, strong HCl reaction, medium to fine gravel size fresh shell fragments	SP-SM	-0.6		10	S-3, SPT 4+4+3 REC=0", 0%		5.0 - 7.5 ft: uniform drilling resistance, smooth drilling, dark gray cuttings
9.5 - 17.0	POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, contains mica, estimated <5% shell fragments, fine gravel size highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-8.1		15	S-4, SPT 9+5+6 REC=11", 61%		9.0 ft: switched 3 1/2" OD tricone roller bit (mud rotary) and advanced to 50 ft, mixed one bag of bentonite with 125 gallons of water to make drilling fluid, uniform drilling resistance, smooth drilling, gray drilling fluid
13.5 ft	Changes to weak HCl reaction, coarse sand size moderately weathered shell fragments	SP-SM				S-5, SPT 2+3+5 REC=17", 94%		
17.0 - 22.0	SILTY SAND, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, estimated <5% fine gravel, strong HCl reaction, strong cementation, coarse sand to coarse gravel size fresh to highly weathered shell fragments, fine gravel as cemented sands	SM				S-6, SPT 3+3+5 REC=18", 100%		17.5 ft: bit chatter, gray drilling fluid
						S-7, SPT 25+23+14 REC=16", 89%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
22.0	22.0 - 32.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated <5% shell fragments, estimated <5% fine gravel, strong HCl reaction, moderate cementation, coarse sand to fine gravel size fresh to moderately weathered shell fragments, gravel as cemented sands	SM	-13.1					21.0 - 21.5 ft: bit chatter
		SP-SM			25	S-8, SPT 21+10+9 REC=18", 100%		23.5 - 28.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
					30	S-9, SPT 31+35+18 REC=14", 78%		
32.0	32.0 - 37.0 ft: SILTY SAND, fine grained sand, moist, olive gray, estimated <5% shell fragments, estimated <5% fine gravel, strong HCl reaction, strong cementation, coarse sand to fine gravel size highly weathered shell fragments, fine gravel as cemented sand	SM	-23.1					33.5 - 38.5 ft: uniform drilling resistance, smooth drilling
					35	S-10, SPT 15+16+21 REC=18", 100%		
37.0	37.0 - 42.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, olive gray, estimated <5% shell fragments, weak HCl reaction, coarse sand size, highly weathered shell fragments	SP-SM	-28.1					
					40	S-11, SPT 5+7+10 REC=18", 100%		
42.0	42.0 - 47.0 ft: SILTY SAND, fine grained sand, moist, olive gray, estimated <5% shell fragments, weak HCl reaction, coarse sand size, moderately to highly weathered shell fragments	SM	-33.1					43.5 - 48.5 ft: uniform drilling resistance, smooth drilling
					45	S-12, SPT 7+8+10 REC=18", 100%		

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-821**
Schnabel No.: 06120048
Sheet: 3 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
47.0	47.0 - 50.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand size, fresh shell fragments, strong HCl reaction with shells, weak HCl reaction with soil	SP-SM	-38.1					
50.0			-41.1		50	S-13, SPT 5+9+11 REC=18", 100%		

Bottom of Boring at 50.0 ft.

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

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- glNT Logs -

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-342**
Schnabel No.: 06120048
Sheet: 1 of 10

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: W. Wolfe

Schnabel Representative: D. Cepull

Equipment: CME-550; AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3 1/4" O.D. Tri-Cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/31/08 Finished: 8/5/08

Easting: 960272.2 ft Northing: 217216.7 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 76.0 (ft) Total Depth: 250.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/31	4:58 PM	12.5'	13.0'	---
Start of Day	8/1	6:53 AM	-1.3'	13.0'	---
End of Day	8/1	2:00 PM	-1.5'	13.0'	---
Start of Day	8/4	8:45 AM	7.0'	13.0'	---
End of Day	8/4	6:08 PM	-0.5'	13.0'	---
Start of Day	8/5	7:00 AM	13.0'	13.0'	---
Completion	8/5	6:28 PM	3.0'	13.0'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.5	0.0 - 0.5 ft: Rootmat and topsoil, organics		75.5			S-1, SPT 1+1+2 REC=17", 94%		0.0 ft: advanced 4 1/4" ID HSA to 12.5 ft; 0.0 to 2.5 interval: uniform drilling resistance, orangish brown sand with silt cuttings; changes as noted below; see end of boring log for additional remarks
	0.5 - 8.4 ft: POORLY GRADED SAND WITH SILT, medium grained sand, moist, orangish brown, contains mica, no HCl reaction	SP-SM				S-2, SPT 1+2+3 REC=15", 83%		
	5.0 ft: Changes to homogenous structure				5	S-3, SPT 4+5+4 REC=13", 72%		
	7.5 ft: Changes to contains iron cemented sand layer between 7.5 and 7.6 ft					S-4, SPT 5+5+2 REC=18", 100%		7.5 - 8.4 ft: jar labeled as S-4A
8.4	8.4 - 12.0 ft: CLAYEY SAND, medium grained sand, moist, orangish brown and light gray, contains mica, no HCl reaction	SC	67.6		10	S-5, SPT 1+1+2 REC=13", 72%		8.4 - 9.0 ft: jar labeled as S-4B
	9.5 ft: Changes to no mica							
12.0	12.0 - 14.5 ft: LEAN CLAY WITH SAND, moist, gray, contains mica, no HCl reaction, soft, homogenous structure	CL	64.0			S-6, SPT 2+3+8 REC=18", 100%		12.5 ft: encountered groundwater; switch to 3-1/4" OD tricone roller bit and advanced to 248.5 ft; marsh funnel test performed, 35 sec drilling fluid
14.5	14.5 - 17.5 ft: CLAYEY SAND, fine to medium grained sand, moist, gray, contains mica, no HCl reaction	SC	61.5		15	S-7, SPT 1+2+3 REC=18", 100%		15.0 - 18.5 ft: uniform drilling resistance, brownish gray drilling fluid, clayey sand cuttings
17.5	17.5 - 32.0 ft: SANDY LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction, soft, homogenous structure	CL	58.5			S-8, SPT 2+3+3 REC=18", 100%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
23.5 ft:	Changes to contains ~ 1 inch layer of silty sand				S-9, SPT 3+3+4 REC=18", 100%		
25.0 ft:	Changes to firm				S-10, SPT WOH+1+4 REC=13", 72%		
		CL			S-11, SPT 3+4+5 REC=18", 100%		
30.0 ft:	Changes to hard				S-12, SPT 4+6+8 REC=18", 100%		
32.0	32.0 - 34.5 ft: FAT CLAY WITH SAND, fine grained sand, moist, gray, contains mica, no HCl reaction, hard, homogenous structure	CH	44.0		S-13, SPT 6+7+8 REC=18", 100%		32.5 - 35.0 ft: uniform drilling resistance, gray drilling fluid
34.5	34.5 - 37.0 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, no HCl reaction, homogenous structure	SM	41.5		S-14, SPT 3+3+4 REC=18", 100%		
37.0	37.0 - 39.5 ft: SILTY SAND, fine to medium grained sand, moist, gray, contains mica, no HCl reaction, homogenous structure	SM	39.0		S-15, SPT 5+9+13 REC=18", 100%		
39.5	39.5 - 40.5 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, no HCl reaction	SM	36.5		S-16, SPT 33+49+50/3" REC=15", 96%		40.0 - 40.5 ft: jar labeled as S-16A
40.5	40.5 - 42.0 ft: SILTY GRAVEL WITH SAND, fine to coarse gravel, subangular particles, moist, gray, contains mica, no HCl reaction, gravel as cemented sand	GM	35.5		S-17, SPT 23+24+36 REC=18", 100%		40.0 - 41.0 ft: uniform drilling resistance
42.0	42.0 - 49.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, contains mica, highly weathered shells, weak HCl reaction with soil	SP-SM	34.0		S-18, SPT 19+43+50/4" REC=16", 103%		40.5 - 41.3 ft: jar labeled as S-16B
	44.5 ft: Changes to estimated 15 - 25% shell fragments						41.0 - 42.5 ft: hard drilling
	45.8 ft: Changes to laminated						42.5 - 45.0 ft: uniform drilling resistance
							45.0 - 47.5 ft: light gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
47.5	Changes to estimated 5 - 10% shell fragments, highly weathered shell fragments	SP-SM				S-19, SPT 35+41+32 REC=18", 100%		47.5 - 50.0 ft: gray drilling fluid
49.5	49.5 - 51.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray, estimated 5 - 10% shell fragments, contains mica, no HCl reaction	SP-SM	26.5		50	S-20, SPT 7+11+16 REC=18", 100%		50.0 - 51.5 ft: jar labeled as S-20A
51.0	51.0 - 52.0 ft: LEAN CLAY, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, weak HCl reaction	CL	25.0			S-21, SPT 4+4+6 REC=18", 100%		51.0 - 51.5 ft: jar labeled as S-20B
52.0	52.0 - 54.5 ft: SANDY LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction, hard, homogenous structure	CL	24.0					
54.5	54.5 - 60.0 ft: CLAYEY SAND, fine grained sand, moist, gray, contains shell fragments, contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)	SC	21.5		55	S-22, SPT 4+4+5 REC=18", 100%		
60.0	60.0 - 61.5 ft: POORLY GRADED SAND WITH SILT AND GRAVEL, fine grained sand, subangular particles, moist, gray, contains mica, no HCl reaction, gravel as cemented sand	SP-SM	16.0		60	S-24, SPT 50/6" REC=6", 100%		60.0 - 62.5 ft: uniform drilling resistance
61.5	61.5 - 64.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated 15 - 25% fine gravel, contains mica, contains shell fragments, subangular fine gravel as cemented sands, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	14.5			S-25, SPT 6+22+10 REC=18", 100%		62.5 - 64.5 ft: rod chatter
64.5	64.5 - 67.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated 15 - 25% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	11.5		65	S-26, SPT 4+6+8 REC=18", 100%		65.0 - 66.5 ft: uniform drilling resistance
67.0	67.0 - 72.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated 5 - 10% shells, contains mica, no HCl reaction, moderately weathered shells	SP-SM	9.0			S-27, SPT 3+5+6 REC=18", 100%		
70.0	Changes to weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM			70	S-28, SPT 5+10+11 REC=18", 100%		70.0 - 71.5 ft: uniform drilling resistance
72.5	72.5 - 74.0 ft: SILTY GRAVEL WITH SAND, fine gravel, subangular particles, moist, gray, contains mica,	GM	3.5			S-29, SPT 50/4" REC=4", 111%		72.5 - 74.0 ft: hard drilling

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
74.0	gravel as fresh to moderately weathered shell fragments, weak HCl reaction (with shells)	SP-SM	2.0		75	S-30, SPT 4+7+9 REC=18", 100%		74.0 - 75.0 ft: uniform drilling resistance, smooth drilling 75.0 - 76.5 ft: uniform drilling resistance
77.0	74.0 - 77.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, contains shell fragments, contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)		-1.0					
	77.0 - 82.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, contains mica, no HCl reaction	SP-SM			80	S-31, SPT 5+4+6 REC=18", 100%		
82.0	82.0 - 84.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, contains shell fragments, contains mica, weak HCl reaction (with shells), no HCl reaction (with soil), shell fragments inclusions between 83.1 and 83.8 ft	SP-SM	-6.0			S-32, SPT 3+5+6 REC=18", 100%		
84.5	84.5 - 87.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray, contains shell fragments, contains mica, no HCl reaction, layer of cemented sands and shell fragments between 85.4 and 85.6 ft	SP-SM	-8.5		85	S-33, SPT 3+3+5 REC=18", 100%		
87.0	87.0 - 89.5 ft: POORLY GRADED SAND WITH SILT, medium grained sand, wet, gray, estimated 5 - 10% shell fragments, contains mica, weak HCl reaction, highly weathered shell fragments; layer of light gray cemented sands with shell fragments between 88 to 88.4 ft	SP-SM	-11.0			S-34, SPT 3+13+9 REC=18", 100%		
89.5	89.5 - 92.0 ft: POORLY GRADED SAND WITH SILT AND GRAVEL, fine to medium grained sand, wet, gray, estimated 15 - 25% fine gravel, estimated <5% shell fragments, contains mica, subangular gravel as cemented sands, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-13.5		90	S-35, SPT 5+35+38 REC=18", 100%		87.5 - 88.0 ft: uniform drilling resistance 88.0 - 90.0 ft: hard drilling
92.0	92.0 - 94.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray, estimated 5 - 10% shell fragments, contains fine gravel, contains mica, subangular gravel as cemented sands, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-16.0			S-36, SPT 7+46+50/4" REC=18", 115%		92.0 - 92.5 ft: hard drilling from 90 to 92 ft, easy drilling from 92 to 92.5 ft
94.5	94.5 - 98.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated <5% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-18.5		95	S-37, SPT 7+50/6" REC=12", 100%		92.5 - 95.0 ft: uniform drilling resistance from 92.5 to 93, hard drilling from 93 to 94.5 ft, break through hard material at 94.5 ft
98.0	98.0 - 107.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated <5% shell fragments, contains mica, subangular gravel as cemented sands, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-22.0			S-38, SPT 39+20+16 REC=18", 100%		95.0 - 98.5 ft: uniform drilling resistance, gray drilling fluid
					100	S-39, SPT 6+9+13 REC=18", 100%		98.5 - 103.5 ft: marsh funnel test performed, 40 sec drilling fluid

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-342
Schnabel No.: 06120048
Sheet: 5 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	SAND WITH SILT, fine grained sand, moist, gray, contains shell fragments, contains mica, no HCl reaction							98.5 - 103.5 ft: marsh funnel test performed, 40 sec drilling fluid (continued)
	103.5 ft: Changes to fine to medium grained sand, homogenous structure, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM			105	S-40, SPT 7+8+11 REC=18", 88%		103.5 - 108.5 ft: light gray drilling fluid
107.5	107.5 - 117.5 ft: SILTY SAND, fine grained sand, moist, gray, contains shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-31.5		110	S-41, SPT 6+9+14 REC=18", 100%		
	114.4 ft: Changes to contains highly weathered shell inclusions ~ 1 inch thick				115	S-42, SPT 5+7+10 REC=18", 100%		
117.5	117.5 - 122.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, contains mica, highly weathered shell fragments	SP-SM	-41.5		120	S-43, SPT 7+6+8 REC=18", 100%		118.5 - 123.5 ft: gray drilling fluid
122.5	122.5 - 132.5 ft: SILTY SAND, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-46.5		125	S-44, SPT 6+6+10 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
	128.5 ft: Changes to contains shell fragments, weak HCl reaction	SM			S-45, SPT 5+8+11 REC=18", 100%		128.5 - 133.5 ft: no solid cuttings
132.5	132.5 - 138.0 ft: SANDY SILT, fine grained sand, moist, gray, contains mica, weak HCl reaction, homogenous structure	ML	-56.5		S-46, SPT 7+10+13 REC=18", 100%		
138.0	138.0 - 142.5 ft: SANDY SILT, fine grained sand, moist, gray, estimated <5% shell fragments, contains mica, weak HCl reaction, hard, highly weathered shell fragments	ML	-62.0		S-47, SPT 3+5+7 REC=18", 100%		
142.5	142.5 - 147.5 ft: SANDY SILT, fine grained sand, moist, gray, contains shell fragments, contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)	ML	-66.5		S-48, SPT 6+8+11 REC=18", 100%		
147.5	147.5 - 152.5 ft: SANDY SILT, fine grained sand, moist, brownish gray, contains mica, weak HCl reaction	ML	-71.5		S-49, SPT 6+10+11 REC=18", 100%		
	153.5 ft: Changes to hard, homogenous structure				S-50, SPT 5+8+12 REC=18", 100%		153.5 - 158.5 ft: no solid cuttings in drilling fluid

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-342**
Schnabel No.: 06120048
Sheet: 7 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
					155			153.5 - 158.5 ft: no solid cuttings in drilling fluid (continued)
						S-51, SPT 6+9+13 REC=18", 100%		
					160			
						S-52, SPT 7+9+11 REC=18", 100%		
					165			
						S-53, SPT 7+8+10 REC=7", 39%		ML
					170			
						S-54, SPT 5+8+14 REC=18", 100%		
					175			
						S-55, SPT 7+8+11 REC=18", 100%		
					180			

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
182.5	182.5 - 187.0 ft: SANDY SILT, fine to medium grained sand, moist, brownish gray, contains mica, no HCl reaction, firm, homogenous structure	ML	-106.5				
		ML			S-56, SPT 6+8+8 REC=18", 100%		
187.0	187.0 - 197.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, brownish gray, contains shell fragments, contains mica, no HCl reaction, highly to moderately weathered shell fragments	SP-SM	-111.0				
					S-57, SPT 6+8+13 REC=18", 100%		
					S-58, SPT 4+7+13 REC=18", 100%		
197.5	197.5 - 207.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray, contains mica, no HCl reaction	SP-SM	-121.5				
					S-59, SPT 4+6+11 REC=18", 100%		
	203.5 ft: Changes to moist				S-60, SPT 5+7+13 REC=18", 100%		
207.5	207.5 - 212.5 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, no HCl reaction	SM	-131.5				

198.5 - 203.5 ft:
uniform
resistance, gray
drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
212.5	212.5 - 242.5 ft: SANDY SILT, fine grained sand, moist, gray, contains mica, no HCl reaction, hard, homogenous structure	SM	-136.5		210	S-61, SPT 5+7+11 REC=18", 100%		213.5 - 215.0 ft: sandy silt cuttings
					215	S-62, SPT 6+9+12 REC=18", 100%		
	218.5 ft: Changes to weak HCl reaction				220	S-63, SPT 7+10+14 REC=18", 100%		
		ML			225	S-64, SPT 6+8+13 REC=18", 100%		
	228.5 ft: Changes to brownish gray				230	S-65, SPT 7+10+13 REC=18", 100%		
					235	S-66, SPT 7+8+12 REC=18", 100%		

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-342**
Schnabel No.: 06120048
Sheet: 10 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
		ML			240	S-67, SPT 6+9+16 REC=18", 100%		
242.5	242.5 - 250.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm, homogenous structure	ML	-166.5		245	S-68, SPT 6+9+15 REC=17", 94%		243.5 - 248.5 ft: uniform drilling resistance, gray drilling fluid
250.0			-174.0		250	S-69, SPT 9+11+16 REC=18", 100%		

Bottom of Boring at 250.0 ft.

NOTE: Negative groundwater depth denotes water level above ground surface (i.e. "negative depth"), but does not necessarily imply artesian conditions.

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-343**
Schnabel No.: 06120048
Sheet: 1 of 10

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: W. Wolfe

Schnabel Representative: D. Cepull

Equipment: CME-550

Method: 4-1/4" I.D. Hollow Stem Auger,
3 1/4" O.D. Tri-Cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/28/08 **Finished:** 7/31/08

Easting: 960306 ft **Northing:** 217039 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 83± (ft) **Total Depth:** 250.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/28	---	14.0'	13.0'	---
End of Day	7/28	6:00 PM	-1.0'	13.0'	---
Start of Day	7/29	7:00 AM	7.0'	13.0'	---
End of Day	7/29	2:20 PM	4.7'	13.0'	---
Start of Day	7/30	7:19 AM	7.5'	13.0'	---
End of Day	7/30	6:05 PM	-1.0'	13.0'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.4	0.0 - 0.4 ft: ORGANIC SOIL		82.8			S-1, SPT WOH/12"+2 RQD=10", 56%		0.0 ft: Advanced 4-1/4" I.D. HSA to 13.0 ft. Changes as noted below, see end of boring log for additional remarks.
	0.4 - 4.5 ft: POORLY GRADED SAND WITH SILT, medium grained sand, moist, orangish brown, no HCl reaction, light licorice odor	SP-SM				S-2, SPT 1+2+3 RQD=5", 28%		
4.5	4.5 - 5.9 ft: POORLY GRADED SAND, medium grained sand, moist, orangish brown, no HCl reaction	SP	78.7		5	S-3, SPT 2+2+3 RQD=18", 100%		
5.9	5.9 - 7.0 ft: SILTY SAND, medium grained sand, moist, orangish brown, no HCl reaction	SM	77.3					5.0 - 5.9 ft: jar labeled as S-3A
7.0	7.0 - 12.0 ft: POORLY GRADED SAND WITH SILT, medium grained sand, moist, orangish brown with mottles of white, no HCl reaction	SP-SM	76.2		10	S-4, SPT 2+3+4 RQD=15", 83%		5.9 - 6.5 ft: jar labeled as S-3B
12.0	12.0 - 12.9 ft: SILTY SAND, medium grained sand, moist, orangish brown with mottles of white, no HCl reaction	SM	71.2					
12.9	12.9 - 14.5 ft: POORLY GRADED SAND WITH SILT, medium grained sand, moist, gray, contains mica, no HCl reaction	SP-SM	70.3			S-6, SPT 1+2+2 RQD=18", 100%		12.5 - 12.9 ft: jar labeled as S-6A
14.5	14.5 - 17.5 ft: SILTY SAND, moist, gray, contains mica, no HCl reaction	SM	68.7		15	S-7, SPT WOH+1+3 RQD=16", 89%		12.9 - 14.0 ft: jar labeled as S-6B
17.5	17.5 - 19.0 ft: LEAN CLAY WITH SAND, fine grained sand, wet, gray, contains mica, no HCl reaction	CL	65.7					13.0 ft: Switched to 3-1/4" O.D. tricone roller bit (mud rotary) and advanced to 250.0 ft. mixed 12 bags of bentonite to 110 gallons of water
19.0	19.0 - 22.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand,	SP-SM	64.2			S-8, SPT 3+4+5 RQD=18", 100%		13.0 - 15.0 ft: Uniform drilling resistance, light brown drilling fluid, encountered water at 14.0 ft.

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	wet, gray, contains mica, no HCl reaction	SP-SM					18.5 - 19.0 ft: jar labeled as S-8A 19.0 - 20.0 ft: jar labeled as S-8B
22.5	22.5 - 27.0 ft: SANDY LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction	CL	60.7		S-9, SPT 2+3+4 RQD=18", 100%		23.5 - 28.5 ft: light gray drilling fluid
27.0	27.0 - 39.5 ft: LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction	CL	56.2		S-10, SPT 3+3+5 RQD=18", 100%		
32.5 ft:	Changes to firm	CL			S-11, SPT 3+4+4 RQD=18", 100%		32.5 - 35.0 ft: white drilling fluid
35.0 ft:	Changes to hard				S-12, SPT 4+5+6 RQD=18", 100%		
39.5	39.5 - 42.0 ft: CLAYEY SAND, fine grained sand, moist, gray, contains mica, no HCl reaction	SC	43.7		S-14, SPT 5+5+7 RQD=18", 100%		
42.0	42.0 - 43.0 ft: LEAN CLAY WITH SAND, fine grained sand, moist, gray, contains mica, no HCl reaction, hard	CL	41.2		S-15, SPT 4+9+10 RQD=18", 100%		42.5 - 43.0 ft: jar labeled as S-15A
43.0	43.0 - 44.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray, contains cemented sands, contains mica, no HCl reaction	SP-SM	40.2				43.0 - 44.0 ft: jar labeled as S-15B
44.5	44.5 - 47.0 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, no HCl reaction	SM	38.7		S-16, SPT 8+13+19 RQD=18", 100%		45.0 - 47.5 ft: increased drilling resistance at 46.0 ft, light gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
47.0	47.0 - 48.0 ft: SILTY SAND, fine grained sand, moist, gray, contains cemented sands, contains mica, no HCl reaction	SM	36.2					
48.0	48.0 - 49.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, contains mica, highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	35.2			S-17, SPT 41+45+35 RQD=18", 100%		47.5 - 50.0 ft: uniform drilling resistance, light gray drilling fluid
49.5	49.5 - 52.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, no HCl reaction	SP-SM	33.7		50	S-18, SPT 38+50/3" RQD=9", 94%		47.5 - 48.0 ft: jar labeled as S-17A
52.5	52.5 - 57.8 ft: POORLY GRADED SAND WITH SILT, medium to coarse grained sand, angular particles, wet, gray, estimated 30 - 45% shell fragments, contains mica, highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil), coarse sand consists of shell fragments	SP-SM	30.7			S-19, SPT 50/3" RQD=3", 83%		48.0 - 49.0 ft: jar labeled as S-17B
57.8	57.5 ft: Changes to strong HCl reaction (with shells), weak HCl reaction (with soil)		25.4		55	S-20, SPT 23+18+19 RQD=12", 67%		
	57.8 - 64.5 ft: SANDY SILT, fine grained sand, moist, gray, contains mica, no HCl reaction					S-21, SPT 7+6+6 RQD=15", 83%		57.5 - 57.8 ft: jar labeled as S-21A
	60.0 ft: Changes to weak HCl reaction				60	S-22, SPT 4+4+5 RQD=18", 100%		57.8 - 59.0 ft: jar labeled as S-21B
	63.6 ft: Changes to contains shell fragments	ML				S-23, SPT 4+4+5 RQD=18", 100%		
64.5	64.5 - 67.0 ft: SILTY SAND, wet, gray, contains cemented sands, contains mica, no HCl reaction (with shells), no HCl reaction (with cemented sands)	SM	18.7		65	S-24, SPT 50/1" RQD=1", 83%		65.0 - 67.5 ft: uniform, but considerable drilling resistance, light gray drilling fluid
67.0	67.0 - 69.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray with mottles of white, estimated 15 - 25% shell fragments, contains mica, strong HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	16.2			S-25, SPT 7+7+10 RQD=18", 100%		67.5 - 69.5 ft: uniform drilling resistance
69.5	69.5 - 72.0 ft: SILTY SAND, fine to coarse grained sand, subrounded particles, wet, gray, estimated 15 - 25% shell fragments, contains mica, contains 0.1 ft thick cemented sand layer at 71.5 ft, highly weathered shell fragments, weak HCl reaction (shells), no HCl reaction (soil)	SM	13.7		70	S-26, SPT 14+24+20 RQD=18", 100%		69.5 - 70.0 ft: harder drilling
72.0	72.0 - 79.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated 5 - 10% shell	SP-SM	11.2			S-27, SPT 5+4+7 RQD=11", 61%		70.0 - 72.5 ft: uniform drilling resistance

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)				75	S-28, SPT 4+7+7 RQD=18", 100%		
		SP-SM						
	77.5 ft: Changes to estimated 15 - 25% shell fragments					S-29, SPT 7+10+19 RQD=18", 100%		
79.5	79.5 - 84.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated <5% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	3.7		80	S-30, SPT 4+5+8 RQD=18", 100%		
	82.5 ft: Changes to contains shell fragments					S-31, SPT 5+5+8 RQD=18", 100%		
84.5	84.5 - 92.0 ft: POORLY GRADED SAND WITH SILT, wet, gray, contains shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-1.3		85	S-32, SPT 5+4+7 RQD=18", 100%		
	87.5 ft: Changes to homogenous structure					S-33, SPT 3+4+6 RQD=18", 100%		
		SP-SM			90	S-34, SPT 3+5+5 RQD=18", 100%		
92.0	92.0 - 94.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray with streaks of white, estimated 15 - 25% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil), contains shell layer at 93.0 ft	SP-SM	-8.8			S-35, SPT 5+10+13 RQD=18", 100%		
94.5	94.5 - 102.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, light gray, estimated 15 - 25% shell fragments, contains mica, moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)		-11.3		95	S-36, SPT 50/5" RQD=5", 104%		95.5 ft: hard drilling
	97.5 ft: Changes to estimated <5% shell fragments, estimated 15 - 25% cemented sands					S-37, SPT 50/2" RQD=2", 83%		97.0 ft: easy drilling
		SP-SM						98.5 ft: soft drilling
	100.0 ft: Changes to gray, estimated <5% shell fragments, contains				100	S-38, SPT 50/5"		99.5 ft: hard drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
102.0	cemented sands, sands as gravel sized fragments, weak HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-18.8			RQD=5", 104%		102.0 ft: softer drilling 102.5 - 108.5 ft: uniform drilling resistance, marsh funnel test performed, 50 sec drilling fluid
	102.0 - 107.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, contains shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM			105	S-39, SPT 6+12+20 RQD=18", 100%		
107.0	107.0 - 112.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-23.8		110	S-40, SPT 5+7+10 RQD=18", 100%		
112.0	112.0 - 122.5 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, no HCl reaction, homogenous structure	SM	-28.8		115	S-41, SPT 5+7+10 RQD=18", 100%		
					120	S-42, SPT 7+7+10 RQD=18", 100%		
122.5	122.5 - 137.0 ft: SILTY SAND, fine grained sand, moist, gray, contains shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-39.3		125	S-43, SPT 6+10+11 RQD=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	128.5 ft: Changes to estimated 5 - 10% shell fragments				130	S-44, SPT 5+9+21 RQD=18", 100%		
		SM						
	133.5 ft: Changes to shell fragments, contains shell layers at 134.2 ft				135	S-45, SPT 6+7+11 RQD=18", 100%		
137.0	137.0 - 142.5 ft: SANDY SILT, fine grained sand, moist, gray, contains mica, weak HCl reaction, hard, homogenous structure	ML	-53.8		140	S-46, SPT 6+9+13 RQD=18", 100%		
142.5	142.5 - 147.5 ft: SILTY SAND, fine grained sand, moist, gray, estimated <5% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), weak HCl reaction (with soil)	SM	-59.3		145	S-47, SPT 5+6+12 RQD=18", 100%		143.5 - 148.5 ft: uniform drilling resistance, light gray drilling fluid
147.5	147.5 - 192.0 ft: SANDY SILT, fine grained sand, moist, gray, contains mica, weak HCl reaction	ML	-64.3		150	S-48, SPT 5+8+9 RQD=18", 100%		
	153.5 ft: Changes to no HCl reaction, homogenous structure					S-49, SPT 6+6+10 RQD=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
					155			

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
							183.0 - 185.0 ft: sandy silt cuttings
		ML			S-55, SPT 4+8+9 RQD=18", 100%		
					185		
					S-56, SPT 6+9+12 RQD=18", 100%		
					190		
192.0	192.0 - 197.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, gray, estimated 5 - 10% shell fragments, contains mica, moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-108.8		S-57, SPT 8+12+15 RQD=18", 100%		
					195		
197.5	197.5 - 202.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, contains shell fragments, contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-114.3		S-58, SPT 4+7+11 RQD=18", 100%		
					200		
202.5	202.5 - 207.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, weak HCl reaction, homogenous structure	SP-SM	-119.3		S-59, SPT 5+6+11 RQD=18", 100%		
					205		
207.5	207.5 - 217.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, contains mica, no HCl	SP-SM	-124.3				

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	reaction				210 S-60, SPT 4+6+9 RQD=18", 100%		
	213.5 ft: Changes to homogenous structure	SP-SM			215 S-61, SPT 5+5+10 RQD=18", 100%		213.5 - 218.5 ft: uniform drilling resistance, gray drilling fluid
217.5	217.5 - 227.5 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, weak HCl reaction, homogenous structure	SM	-134.3		220 S-62, SPT 6+7+10 RQD=18", 100%		
227.5	227.5 - 232.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, contains mica, weak HCl reaction	SP-SM	-144.3		225 S-63, SPT 8+12+13 RQD=13", 72%		
232.5	232.5 - 242.5 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, no HCl reaction	SM	-149.3		230 S-64, SPT 7+8+12 RQD=18", 100%		228.5 - 233.5 ft: brownish gray drilling fluid
					235 S-65, SPT 7+9+13 RQD=18", 100%		

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-343**
Schnabel No.: 06120048
Sheet: 10 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
		SM			240	S-66, SPT 6+7+14 RQD=18", 100%		
242.5	242.5 - 250.0 ft: POORLY GRADED SAND WITH SILT, moist, brownish gray, contains mica, weak HCl reaction, homogenous structure	SP-SM	-159.3		245	S-67, SPT 5+18+13 RQD=18", 100%		243.5 - 248.5 ft: uniform drilling resistance, brownish gray drilling fluid, no solid cuttings
250.0			-166.8		250	S-68, SPT 7+10+13 RQD=18", 75%		

Bottom of Boring at 250.0 ft.

NOTE: Negative groundwater depth denotes water level above ground surface (i.e. "negative depth"), but does not necessarily imply artesian conditions.

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-344
Schnabel No.: 06120048
Sheet: 1 of 10

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: W. Wolfe

Schnabel Representative: D. Cepull

Equipment: CME-550; AWJ/NWJ Rods

Method: 6 1/4" I.D. Hollow Stem Auger
3 1/4" O.D. Tri-Cone Roller Bit,
6" O.D. Tri-Cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/16/08 **Finished:** 7/24/08

Easting: 960358 ft **Northing:** 216976.8 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 72.3 (ft) **Total Depth:** 250.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/16	8:59 AM	8.0'	8.0'	---
End of Day	7/16	6:00 PM	1.0'	8.0'	---
Start of Day	7/17	7:30 AM	3.0'	8.0'	---
End of Day	7/17	6:08 PM	1.5'	8.0'	---
Start of Day	7/18	7:15 AM	20.0'	8.0'	---
End of Day	7/18	2:00 PM	1.0'	8.0'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.7	0.0 - 0.7 ft: Rootmat and topsoil, roots		71.6			S-1, SPT 1+1+1 REC=11", 61%		0.0 - 2.5 ft: Advanced 6 inches HSA auger to 8.0 ft, 0.0 to 2.5 ft, interval uniform drilling resistance, light brown cuttings. Changes as noted below. See end of boring log for additional remarks
	0.7 - 4.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, light brown, contains roots							
	2.5 ft: Changes to medium to coarse grained sand, subrounded particles, contains gravel, rounded gravel fracture	SP-SM				S-2, SPT 2+2+1 REC=14", 78%		
4.5	4.5 - 7.0 ft: CLAYEY SAND, fine to medium grained sand, moist, light orangish brown, no HCl reaction, homogenous structure	SC	67.8		5	S-3, SPT 1+2+3 REC=11", 61%		
7.0	7.0 - 8.4 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, orangish brown	SP-SM	65.3			S-4, SPT 2+2+2 REC=17", 94%		7.5 - 8.4 ft: jar labeled as S-4A 8.0 ft: encountered groundwater switched from 6 1/4 inch HSA to 3 1/4 inch O.D. tricone roller bit (mud rotary) 8.0 - 10.0 ft: Advanced 3 inch O.D. tricone roller marsh funnel test performed = 45 sec. bit to 178.5 ft. 8.0 to 10.0 ft internal uniform drilling resistance, light brown drilling fluid. 8.4 - 9.0 ft: jar labeled as S-4B 15.0 ft: drilling fluid changes to gray 15.1 - 18.5 ft: light to gray drilling fluid 18.5 - 19.2 ft: jar labeled S-8A
8.4	8.4 - 9.5 ft: LEAN CLAY WITH SAND, fine grained sand, moist, light orangish brown and light brown, no HCl reaction, soft	CL	63.9					
9.5	9.5 - 12.0 ft: LEAN CLAY WITH SAND, fine grained sand, moist, gray, contains mica, no HCl reaction, soft	CL	62.8		10	S-5, SPT 2+3+3 REC=18", 100%		
12.0	12.0 - 19.2 ft: LEAN CLAY WITH SAND, fine grained sand, moist, gray, contains mica, no HCl reaction, 0.5 inch layer of silty sand between 13.0 to 13.1 ft	CL	60.3		15	S-6, SPT 3+2+4 REC=18", 100%		
						S-7, SPT 3+3+4 REC=18", 100%		
19.2	19.2 - 22.0 ft: POORLY GRADED WITH SILT, fine grained sand, moist,	SP-SM	53.1			S-8, SPT 4+10+11 REC=15", 83%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	gray, contains mica, no HCl reaction	SP-SM					19.2 - 20.0 ft: jar labeled S-8B
22.0	22.0 - 27.0 ft: LEAN CLAY WITH SAND, fine grained sand, moist, gray, no HCl reaction, hard, homogenous structure	CL	50.3		S-9, SPT 4+6+9 REC=18", 100%		18.5 - 22.5 ft: uniform drilling resistance light gray drilling fluid (continued)
				25	S-10, SPT 4+6+7 REC=18", 100%		22.5 - 25.0 ft: gray boring sidewalls "collapsed" between 0 - 25.0 ft, 6 inches 0.0 tricone roller bit used to ream boring between 8 to 25 ft
27.0	27.0 - 32.0 ft: SILTY SAND, fine grained sand, moist, gray, no HCl reaction, homogenous structure	SM	45.3		S-11, SPT 7+7+8 REC=18", 100%		25.0 - 27.5 ft: switched to 3/14 inch tricone roller bit, uniform drilling resistance, light gray drilling fluid
	29.5 ft: Changes to contains mica			30	S-12, SPT 3+4+9 REC=18", 100%		
32.0	32.0 - 34.5 ft: POORLY GRADED SAND WITH SILT, moist, gray, contains mica, no HCl reaction, homogenous structure	SP-SM	40.3		S-13, SPT 9+14+26 REC=18", 100%		32.5 - 35.0 ft: slightly increased drilling resistance between 34.0 and 35.0 ft
34.5	34.5 - 37.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, contains mica, highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	37.8	35	S-14, SPT 33+38+50 REC=18", 100%		
37.0	37.0 - 42.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, no HCl reaction	SP-SM	35.3		S-15, SPT 50/6" REC=6", 100%		
	40.0 ft: Changes to wet			40	S-16, SPT 22+50/5" REC=11", 102%		
42.0	42.0 - 47.0 ft: WELL GRADED SAND WITH SILT, fine to coarse grained sand, subangular particles, moist, gray with speckles of white, contains mica, estimated 15 - 25% shell fragments, highly weathered shell, weak HCl reaction (with shells), no HCl reaction (with shells)	SW-SM	30.3		S-17, SPT 33+32+40 REC=18", 100%		
	45.0 ft: Changes to wet, gray with bands of white			45	S-18, SPT 8+14+13 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
47.0	47.0 - 52.0 ft: SANDY SILT, fine grained sand, moist, gray, contains mica, no HCl reaction, firm, contains 0.1 ft thick highly weathered shell fragment layer at 48.2 ft	ML	25.3			S-19, SPT 3+5+5 REC=18", 100%		
	50.0 ft: Changes to contains shell fragments, contains mica, no HCl reaction (with shells or soil)	ML			50	S-20, SPT 3+4+4 REC=18", 100%		
52.0	52.0 - 54.5 ft: SANDY SILT, fine grained sand, moist, gray, contains mica, no HCl reaction, contains 0.1 inch layer of fine cemented sand at 53.1 ft	ML	20.3			S-21, SPT 16+50/5" REC=11", 102%		52.0 ft: rod chatter
54.5	54.5 - 57.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, no HCl reaction (with shells or soil)	SP-SM	17.8		55	S-22, SPT 15+6+7 REC=18", 100%		52.5 - 55.0 ft: rod chatter throughout entire interval. New batch of drilling fluid mixed for hole, marsh funnel test performed 45 sec drilling fluid
57.0	57.0 - 59.5 ft: SILTY SAND WITH GRAVEL, fine grained sand, wet, gray, contains mica, estimated 15 - 25% shell fragments, fine gravel sized, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	15.3			S-23, SPT 4+43+43 REC=18", 100%		55.0 - 57.5 ft: uniform drilling resistance, light gray drilling fluid
59.5	59.5 - 64.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	12.8		60	S-24, SPT 7+4+4 REC=18", 100%		
	62.5 ft: Changes to moist, contains 0.1 ft shell fragment layers at 62.8 and 63.2 ft	SP-SM				S-25, SPT 4+5+5 REC=18", 100%		
64.5	64.5 - 67.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray and white, estimated 15 - 25% shell fragments, contains mica, white shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	7.8		65	S-26, SPT 5+8+9 REC=18", 100%		65.0 - 67.5 ft: harder drilling from 67.0 to 67.5 ft
67.5	67.5 - 72.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated <5% shell fragments, highly weathered shell fragments, no HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	4.8			S-27, SPT 5+5+7 REC=18", 100%		67.5 - 70.0 ft: uniform drilling resistance, light gray drilling fluid
	70.0 ft: Changes to contains shell fragments	SP-SM			70	S-28, SPT 5+5+8 REC=18", 100%		
72.0	72.0 - 79.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, contains shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	0.3			S-29, SPT 4+4+5 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	75.0 ft: Changes to no HCl reaction (with shells or soil)	SP-SM			75	S-30, SPT 4+3+5 REC=18", 100%		
						S-31, SPT 3+4+4 REC=17", 94%		
79.5	79.5 - 82.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, weak HCl reaction (with shells), no HCl reaction (soil), 0.1 ft thick shell layer at 81.0 ft	SP-SM	-7.2		80	S-32, SPT 5+7+12 REC=18", 100%		81.0 ft: shells oriented 45 degrees to vertical
82.0	82.0 - 87.0 ft: POORLY GRADED SAND WITH SILT AND GRAVEL, fine gravel, subangular particles, wet, gray, estimated 15 - 25% shell fragments, fine gravel sized highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil), fine gravel is shell fragments	SP-SM	-9.7			S-33, SPT 11+50/6" REC=12", 100%		
	85.0 ft: Changes to light gray				85	S-34, SPT 13+47+12 REC=18", 100%		
87.0	87.0 - 89.5 ft: POORLY GRADED SAND WITH SILT AND GRAVEL, fine grained sand, wet, gray, estimated 15 - 25% shell fragments, contains mica, fine gravel sized highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil), fine gravel is shell fragments	SP-SM	-14.7			S-35, SPT 14+32+33 REC=18", 100%		
89.5	89.5 - 92.0 ft: SILTY SAND, fine grained sand, wet, gray, contains shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-17.2		90	S-36, SPT 9+12+12 REC=18", 100%		
92.0	92.0 - 102.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, contains shell fragments, contains mica, highly weathered shell fragments, no HCl reaction (with shells or soil)	SP-SM	-19.7			S-37, SPT 6+8+9 REC=18", 100%		92.5 - 98.5 ft: marsh funnel test performed, 43 sec drilling fluid
	98.5 ft: Changes to moist				95			
					100	S-38, SPT 6+8+11 REC=18", 100%		98.5 - 103.5 ft: uniform drilling resistance, light gray drilling fluid

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-344**
Schnabel No.: 06120048
Sheet: 5 of 10

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
102.5	102.5 - 107.5 ft: SILTY SAND, fine grained sand, moist, gray, contains shell fragments, contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-30.2					98.5 - 103.5 ft: uniform drilling resistance, light gray drilling fluid (continued)
		SM			105	S-39, SPT 6+10+12 REC=18", 100%		
107.5	107.5 - 117.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, contains shell fragments, contains mica, no HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-35.2		110	S-40, SPT 8+8+9 REC=18", 100%		
	113.5 ft: Changes to estimated 5 - 10% shell fragments, highly weathered shell fragments, weak HCl reaction (with shells and soil), shell inclusion at 114.6 ft	SP-SM			115	S-41, SPT 6+5+7 REC=18", 100%		
117.5	117.5 - 127.0 ft: SILTY SAND, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, contains mica, weak HCl reaction (with shells and soil), white shell inclusion at 119.7 ft	SM	-45.2		120	S-42, SPT 6+8+12 REC=18", 100%		
	123.5 ft: Changes to contains shell fragments, homogenous structure	SM			125	S-43, SPT 5+8+10 REC=18", 100%		
127.0	127.0 - 132.5 ft: SANDY SILT, fine grained sand, moist, grayish brown,	ML	-54.7					

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-344**
Schnabel No.: 06120048
Sheet: 6 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	contains mica, weak HCl reaction, hard	ML			130	S-44, SPT 7+9+11 REC=18", 100%		
132.5	132.5 - 137.5 ft: SANDY SILT, fine grained sand, moist, grayish brown, contains shell fragments, contains mica, weak HCl reaction (with shells), weak HCl reaction (with soil)	ML	-60.2		135	S-45, SPT 4+4+8 REC=18", 100%		
137.5	137.5 - 181.0 ft: SANDY SILT, fine grained sand, moist, grayish brown, contains mica, no HCl reaction.		-65.2		140	S-46, SPT 5+7+8 REC=18", 100%		
	143.5 ft: Changes to weak HCl reaction	ML			145	S-47, SPT 6+8+8 REC=18", 100%		
					150	S-48, SPT 6+8+12 REC=18", 100%		
						S-49, SPT 6+7+11 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	gray, contains mica, estimated 5 - 10% shell fragments, weak HCl reaction (with shells), weak HCl reaction (with soil) 183.5 ft: Changes to gray, contains 0.1 ft thick brown cemented sand layer at 184.2 ft.	SM			UD-1, UNDIST REC=16", 67%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	181.5 - 183.5 ft: pushed pitcher sampler 24 inches for 28.2 sec; 16 inch recovery, (continued)
					S-55, SPT 6+11+22 REC=16", 89%		183.5 - 188.5 ft: Switched to 3 1/4 inch O.D. tricone roller bit and advanced roller bit to 188.5 ft, uniform drilling resistance, gray drilling fluid
					S-56, SPT 4+7+18 REC=18", 100%		188.5 ft: switched to 6 inch O.D. tricone roller bit; reamed hole with 6 inch O.D. tricone roller bit between 183.5 and 191.5 ft
191.0	191.0 - 204.0 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, weak HCl reaction 193.5 ft: Changes to no HCl reaction, homogenous structure		-118.7		UD-2, UNDIST REC=23", 96%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	193.0 - 198.5 ft: switched to 3 1/4 O.D. tricone roller bit and advanced roller bit to 198.5 ft, gray silty sand cuttings
		SM			S-57, SPT 3+5+7 REC=16", 89%		
	198.5 ft: Changes to weak HCl reaction				S-58, SPT 4+5+9 REC=10", 56%		198.5 - 201.5 ft: switched to 6 inch O.D. tricone roller bit and advanced tricone roller bit to 206 ft; reamed hole between 193.5 and 201.5 ft
	201.5 ft: Changes to weak HCl reaction				UD-3, UNDIST REC=12", 50%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	201.5 - 203.5 ft: pushed pitcher sample 24", in 38.4 sec, 12" recovery, sample placed in jar and labeled as UD-3
204.0	204.0 - 217.5 ft: SILTY SAND, fine grained sand, moist, contains mica, no HCl reaction, homogenous structure		-131.7		UD-4, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	204.0 - 206.0 ft: pushed pitcher sample 24 inches. 24 inch recovery
		SM			S-59, SPT 5+8+13 REC=18", 100%		206.0 ft: switched to 3 1/4 inch tricone roller bit and advanced roller bit to 208.5 ft

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
					210	S-60, SPT 4+7+9 REC=18", 100%		208.5 ft: switched to 6 inch O.D. tricone roller bit and advanced roller bit to 213.5 ft; reamed hole between 206.0 to 211.5 ft
						UD-5, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	211.5 - 213.5 ft: pushed pitcher sampler 24 inches
		SM			215	S-61, SPT 5+9+12 REC=18", 100%		213.5 ft: switched to 3 1/4 inch O.D. tricone roller bit and advanced roller bit to 218.5 ft, silty sand cuttings
217.5	217.5 - 233.5 ft: SANDY SILT, fine grained sand, moist, contains mica, weak HCl reaction, firm, homogenous structure		-145.2		220	S-62, SPT 6+7+11 REC=18", 100%		218.5 ft: switched to 6 inch O.D. tricone roller bit and advanced roller bit to 221.5 ft; reamed hole from 213.5 to 221.5 ft
						UD-6, UNDIST	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	221.5 - 223.5 ft: pushed pitcher sampler 24 inches in 1 minute 22 sec, 500 lb of pressure required to push tube (hard material), 19.5 inch recovery
	223.5 ft: Changes to no HCl reaction, firm, homogenous structure				225	S-63, SPT 5+7+11 REC=18", 100%		223.5 ft: switched to 3 1/4 inch O.D. tricone roller bit and advanced roller bit to 228.5 ft, no solid cuttings
		ML			230	S-64, SPT 5+8+12 REC=18", 100%		228.5 ft: switched to 6 inch O.D. tricone roller bit and advanced roller bit to 231.5 ft reamed hole between 223.5 and 231.5 ft
	228.5 ft: Changes to soft					UD-7, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	231.5 - 233.5 ft: pushed pitcher tube sample 24 inches in 32.97 sec, 24 inch recovery
	231.5 ft: Changes to weak HCl reaction				235	S-65, SPT 5+8+14 REC=16", 89%		233.5 ft: switched to 3 1/4 O.D. tricone roller bit and advanced roller bit to 238.3
233.5	233.5 - 243.5 ft: SANDY SILT, fine grained sand, moist, brownish gray, contains mica, weak HCl reaction, hard, homogenous structure	ML	-161.2					

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-344**
Schnabel No.: 06120048
Sheet: 10 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
238.5	238.5 ft: Changes to grayish brown, no HCl reaction	ML			240	S-66, SPT 7+8+12 REC=18", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	ft 233.5 - 238.5 ft: Advanced 3 1/4 inch O.D. tricone roller bit to 238.3 ft, uniform drilling resistance, gray drilling fluid (continued) 238.5 ft: switched to 6 inch O.D. tricone roller bit and advanced roller bit to 244.5 ft, reamed hole between 233.5 and 241.5 ft 241.5 - 243.5 ft: pushed pitcher tube sample 24 inches in 52.2 sec, 24 inch recovery 243.5 ft: switched to 3 1/4 O.D. tricone roller bit and advanced roller bit to 248.5 ft
241.5	241.5 ft: Changes to brownish gray, weak HCl reaction					UD-8, UNDIST REC=24", 100%		
243.5	243.5 - 250.0 ft: SANDY SILT, fine grained sand, moist, brownish gray, contains mica, weak HCl reaction, slight organic odor	ML	171.2		245	S-67, SPT 6+10+17 REC=18", 100%		
						S-68, SPT 7+9+13 REC=18", 75%		
250.0			177.7		250			

Bottom of Boring at 250.0 ft.

NOTE: Negative groundwater depth denotes water level above ground surface (i.e. "negative depth"), but does not necessarily imply artesian conditions.



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-345**
Schnabel No.: 06120048
Sheet: 1 of 10

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: P. Patrick/K. Bell

Equipment: CME-75 (Truck); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/31/08 **Finished:** 8/6/08

Easting: 960392.2 ft **Northing:** 217096.7 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 69.3 (ft) **Total Depth:** 250.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/31	---	13.5'	13.5'	---
Start of Day	8/1	7:30 AM	7.0'	13.5'	---
Start of Day	8/4	8:00 AM	22.0'	13.5'	---
Start of Day	8/5	7:10 AM	13.2'	13.5'	---
Start of Day	8/6	7:15 AM	28.0'	13.5'	---
Completion	8/6	12:00 PM	28.5'	13.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
2.0	0.0 - 2.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, yellowish red, estimated <5% fine to coarse gravel, estimated <5% organics, no HCl reaction, homogenous structure	SP-SM	67.3			S-1, SPT 2+2+2, REC=16", 89%		0.0 - 2.5 ft: advanced 4 1/4" ID auger to 10 ft; 0 to 2.5 ft interval: sand with silt cuttings, contains root fragments, hard drilling; changes as noted below, see end of boring log for additional remarks
4.5	2.0 - 4.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, yellowish red, estimated <5% mica, estimated <5% roots, no HCl reaction, homogenous structure, contains large (0.5 inch) gray particles, probably grout that was inside of the augers	SP-SM	64.8			S-2, SPT 3+2+3, REC=18", 100%		
5.8	4.5 - 5.8 ft: SILTY SAND, fine grained sand, moist, pinkish gray, estimated 5 - 10% fine to coarse gravel, strong HCl reaction, homogenous structure	SM	63.5		5	S-3, SPT 4+3+3, REC=13", 72%		5.0 - 7.5 ft: hand drilling 5.0 - 5.8 ft: jar labeled as S-3A 5.8 - 6.5 ft: jar labeled as S-3B
9.5	5.8 - 9.5 ft: SILTY SAND, fine grained sand, moist, olive brown and yellowish red, strong HCl reaction, homogenous structure	SM	59.8			S-4, SPT 3+4+3, REC=16", 89%		
12.5	9.5 - 12.5 ft: SANDY LEAN CLAY, fine grained sand, moist, olive brown with mottles of yellowish red, weak HCl reaction, lensed, clayey sand layers (1 - 3 inches thick), clayey sand tends to be yellowish red while sandy lean clay tends to be olive brown	CL	56.8		10	S-5, SPT 4+5+6, REC=18", 100%		10.0 ft: driller switched to 3 1/2 OD tricone roller bit (mud rotary) and advanced to 250 ft 10.0 - 13.5 ft: olive brown drilling fluid, easy drilling silt clumps in cuttings
14.0	12.5 - 14.0 ft: SANDY LEAN CLAY, fine grained sand, wet, grayish purple, no HCl reaction, firm, homogenous structure	CL	55.3			S-6, SPT 2+3+3, REC=18", 100%		13.5 - 16.0 ft: gray drilling fluid 13.5 - 14.0 ft: jar labeled as S-6A 14.0 - 15.0 ft: jar labeled as S-6B
16.5	14.0 - 16.5 ft: CLAYEY SAND, fine grained sand, wet, grayish purple, estimated <5% mica, no HCl reaction, homogenous structure	SC	52.8		15	S-7, SPT 3+3+4, REC=18", 100%		16.0 - 18.5 ft: easy drilling 16.0 - 16.5 ft: jar labeled as S-7A 16.5 - 17.5 ft: jar labeled as S-7B
18.0	16.5 - 18.0 ft: SANDY LEAN CLAY, fine grained sand, wet, grayish purple, no HCl reaction, hard, homogenous structure	CL	51.3			S-8, SPT 3+4+5, REC=18", 100%		
	18.0 - 23.0 ft: FAT CLAY, wet, grayish pink, no HCl reaction, hard, homogenous structure	CH						

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
21.0	Changes to lensed, contains small pockets (< 0.5 in diameter) of yellowish red sands	CH				S-9, SPT 4+5+7 REC=18", 100%		21.0 - 23.5 ft: harder drilling
23.0	23.0 - 25.5 ft: LEAN CLAY, wet, grayish purple, no HCl reaction, hard, homogenous structure, contains 0.5 inch layer of CLAYEY SAND (SC), wet, grayish purple at 24.8 ft	CL	46.3			S-10, SPT 5+8+9 REC=18", 100%		23.5 - 26.0 ft: uniform drilling resistance, gray drilling fluid
25.5	25.5 - 26.5 ft: CLAYEY SAND, fine grained sand, wet, grayish purple, no HCl reaction, homogenous structure	SC	43.8					
26.5	26.5 - 28.0 ft: SILTY SAND, fine grained sand, wet, grayish purple, no HCl reaction, homogenous structure	SM	42.8			S-11, SPT 3+3+5 REC=18", 100%		26.0 - 28.5 ft: smooth drilling 26.0 - 26.5 ft: jar labeled as S-11A
28.0	28.0 - 30.5 ft: SILTY SAND, fine to medium grained sand, moist, dark gray, contains mica, no HCl reaction, homogenous structure, weak cementation from 28.5 to 30 ft	SM	41.3			S-12, SPT 7+10+13 REC=17", 94%		26.5 - 27.5 ft: jar labeled as S-11B 27.5 ft: Schnabel representative switched from P. Patrick to K. Bell
30.5	30.5 - 33.0 ft: SILTY SAND, fine to medium grained sand, moist, dark gray, estimated <5% shell fragments, fine to medium sand size, highly weathered shell	SM	38.8			S-13, SPT 14+50/6" REC=12", 100%		28.5 - 31.0 ft: uniform drilling resistance, harder drilling
33.0	31.8 ft: Changes to light gray, estimated <5% fine gravel, weak cementation, fine gravel as cemented sand, weak HCl reaction with shells, no HCl reaction with soil		36.3			S-14, SPT 33+50/4" REC=9", 83%		31.0 - 33.5 ft: slight rig chatter at 33 ft (possible cemented sand)
	33.0 - 37.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, light gray, estimated 5 - 10% shells, fine sand sized highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil, shells decrease with depth	SP-SM				S-15, SPT 50/5" REC=5", 83%		33.5 - 36.0 ft: hard drilling
37.5	37.5 - 40.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray and light gray, estimated 50 - 100% shells, weak HCl reaction, fine to medium sand size moderate to highly weathered shells	SP-SM	31.8			S-16, SPT 13+11+19 REC=11", 61%		38.5 - 41.0 ft: softer drilling at 39 ft, clumps of silty sand, fine to medium sand sized shell cuttings
40.5	40.5 - 43.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, light gray, estimated 15 - 25% shells, weak HCl reaction, fine to coarse sand size, fresh to highly weathered shells, angular coarse sand size shells, contains a 1-inch layer of SANDY SILT (ML), fine sand, moist, dark gray, est < 5% shells, weak HCl with soil and shells, soft at 42.4 ft	SP-SM	28.8			S-17, SPT 28+29+13 REC=11", 61%		41.0 - 43.5 ft: steadily easier drilling with depth
43.0	43.0 - 48.0 ft: SANDY LEAN CLAY, fine grained sand, moist, light gray, estimated <5% shells, contains mica, weak HCl reaction, firm to hard, homogenous structure, fine to medium sand size, moderate to highly weathered shells	CL	26.3			S-18, SPT 5+5+7 REC=16", 89%		43.5 - 46.0 ft: uniform drilling resistance, smooth drilling, light gray drilling fluid
						S-19, SPT 3+3+5 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
48.0	46.0 ft: Changes to estimated <5% organics, (organics are possible cattails), fine sand size highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil	CL	21.3					46.0 - 48.5 ft: gray drilling fluid, cuttings are clayey sand, fine to medium sand, fine to medium sand sized shell cuttings (continued)
50.5	48.0 - 50.5 ft: CLAYEY SAND, fine to medium grained sand, moist, contains mica, estimated <5% shells, homogenous structure, fine to medium sand size, fresh to highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil	SC	18.8		50	S-20, SPT 3+4+4 REC=18", 100%		48.5 - 51.0 ft: heavy rig chatter and hard drilling resistance from 50.5 to 51 ft (possible cemented layer)
53.0	50.5 - 53.0 ft: CLAYEY SAND, fine to medium grained sand, moist, gray and brownish gray, estimated <5% shells, estimated 5 - 10% fine gravel, fine to medium sand size fresh to highly weathered shells fine gravel as cemented sand, subangular to subrounded fine gravel, weak HCl reaction with shells, no HCl reaction with cemented sand and soil, moderate to strong cementation	SC	16.3			S-21, SPT 50/6" REC=6", 100%		51.0 - 53.5 ft: hard drilling from 51 to 53 ft, soft drilling from 53 to 53.5 ft
55.5	53.0 - 55.5 ft: SILTY SAND, fine to medium grained sand, wet, light brownish gray, estimated 5 - 10% shells, estimated <5% fine gravel, fine sand to fine angular gravel size fresh to highly weathered shells, fine gravel as cemented sand, subrounded to subangular fine gravel, weak HCl reaction with shells, no HCl reaction with soil	SM	13.8		55	S-22, SPT 5+10+32 REC=16", 89%		53.5 - 56.0 ft: heavy rig chatter at 55.5 ft (possible cemented sand)
60.5	55.5 - 60.5 ft: SILTY SAND, fine to medium grained sand, wet, light olive gray and gray, estimated 15 - 25% shells, fine to angular coarse sand size, fresh to highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil	SM	8.8		60	S-23, SPT 9+6+8 REC=10", 56%		
	58.5 ft: Changes to olive gray and gray, estimated <5% shells, fine to medium sand size, fresh to highly weathered shells					S-24, SPT 4+5+7 REC=18", 100%		
	60.5 - 75.5 ft: SILTY SAND, fine to medium grained sand, wet, dark gray and gray, estimated 5 - 10% shells, fine sand to angular fine gravel size fresh to highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil				65	S-25, SPT 7+8+11 REC=17", 94%		
	63.5 ft: Changes to shell size increases with depth					S-26, SPT 5+8+7 REC=15", 83%		
	66.0 ft: Changes to estimated <5% shells, homogenous structure, fine to medium sand size, moderate to highly weathered shells					S-27, SPT 6+6+10 REC=18", 100%		
	68.5 ft: Changes to olive gray and gray	SM			70	S-28, SPT 4+5+8 REC=18", 100%		68.5 ft: driller desanded mud-tub, driller added 50 gallons of clean water with 1/2 bag of bentonite to drilling fluid, driller flushed hole to prevent collapse over the weekend
	71.0 ft: Changes to gray and light gray					S-29, SPT 4+5+7 REC=18", 100%		
	73.5 ft: Changes to estimated <5%					S-30, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
75.5	shells, fine sand size, highly weathered shells	SM	-6.2		75	4+4+7 REC=18", 100%		
78.0	75.5 - 78.0 ft: SILTY SAND, fine to medium grained sand, wet, gray, estimated <5% shell fragments, fine sand size highly weathered shells, weak HCl reaction with shells and soil, weak cementation from 77.3 to 77.5	SM	-8.7			S-31, SPT 4+16+14 REC=10", 56%		76.0 - 78.5 ft: slight rig chatter at 77 ft (possible cemented sand)
83.0	78.0 - 83.0 ft: SANDY SAND WITH GRAVEL, fine to medium grained sand, wet, gray and light gray, estimated 5 - 10% shells, weak HCl reaction, fine gravel (subrounded to subangular fine gravel), fine to angular coarse sand size, fresh to highly weathered shells, moderate to strong cementation (fine gravels), cementation (fine gravel), cemented sands increase with depth	SM	-13.7		80	S-32, SPT 16+50/5" REC=11", 102%		81.0 - 83.5 ft: slight rig chatter throughout, hard drilling, light gray drilling fluid
88.0	81.0 ft: Changes to estimated 15 - 25% shells, weak HCl reaction with shells, no HCl reaction with cemented sand and soil					S-33, SPT 14+12+40 REC=17", 94%		
	83.0 - 88.0 ft: SILTY SAND, fine to medium grained sand, wet, gray and light gray, estimated 5 - 10% shells, estimated <5% fine gravel, fine to angular coarse sand size, fresh to highly weathered shells, fine gravel as cemented sand, weak HCl reaction with shells, no HCl reaction with cemented sand and soil, weak to moderate cementation	SM			85	S-34, SPT 8+11+35 REC=17", 94%		83.5 - 86.0 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
	86.0 ft: Changes to gray and olive gray, estimated <5% shells, fine to medium sand size, moderate to highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil		-18.7			S-35, SPT 20+26+21 REC=17", 94%		86.0 - 88.0 ft: light gray drilling fluid
	88.0 - 102.5 ft: SILTY SAND, fine to medium grained sand, moist, olive gray, estimated <5% shells, fine to medium size fresh to highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil; contains a 1-inch layer of SILT WITH SAND (ML), olive, fine sand, moist, soft at 88.7 ft, 89 ft and 89.5 ft				90	S-36, SPT 4+6+9 REC=18", 100%		88.5 - 93.5 ft: silty sand, fine to medium sand and fine to medium shell cuttings
	93.5 ft: Changes to fine grained sand, estimated 5 - 10% shells, weak HCl reaction with shells and soil, shell decrease with depth	SM			95	S-37, SPT 11+9+10 REC=18", 100%		93.5 - 98.5 ft: uniform drilling resistance, smooth drilling
	98.5 ft: Changes to estimated <5% shells, homogenous structure, fine to medium sand size, moderately to highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil				100	S-38, SPT 4+6+7 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
102.5	102.5 - 107.5 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated <5% shell fragments, firm, homogenous structure, fine sand size highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil	SM	-33.2					
		ML			105	S-39, SPT 7+10+11 REC=18", 100%		103.5 - 108.5 ft: uniform drilling resistance, smooth drilling
107.5	107.5 - 117.5 ft: SILTY SAND, fine grained sand, moist, olive gray, estimated <5% shells, homogenous structure, fine to medium sand size moderate to highly weathered shells, weak HCl reaction with shells, no HCl reaction with soil	SM	-38.2					
					110	S-40, SPT 6+8+10 REC=18", 100%		108.5 - 113.5 ft: slight rig chatter from 111.0 to 111.5 ft (possible cemented sand), olive gray drilling fluid, clumps of silty sand, fine to medium sand and shells in cuttings
	113.5 ft: Changes to fine to medium grained sand, wet, estimated 5-10% shells, fine sand to angular coarse sand size fresh to highly weathered shells				115	S-41, SPT 6+8+14 REC=18", 100%		
117.5	117.5 - 137.0 ft: SILTY SAND, fine grained sand, moist, olive gray and greenish brown, estimated <5% shells, weak HCl reaction, homogenous structure, fine to medium sand size moderate to highly weathered shells	SM	-48.2					
					120	S-42, SPT 5+6+9 REC=18", 100%		118.5 - 123.5 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid, silty sand, fine to medium sand and shells in cuttings
	123.0 ft: Changes to olive gray and gray, fine sand size, highly weathered shells							
	123.5 ft: Changes to olive gray and grayish brown, fine to medium sand size moderate to highly weathered shells				125	S-43, SPT 7+9+11 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
					130	S-44, SPT 6+7+9 REC=11", 61%	
					135	S-45, SPT 6+9+10 REC=18", 100%	
137.0	133.5 ft: Changes to fine sand size highly weathered shells	SM					128.5 - 133.5 ft: olive gray drilling fluid, marsh funnel test performed (41.0 sec drilling fluid)
					140	S-46, SPT 5+5+8 REC=18", 100%	
137.0	137.0 - 142.5 ft: SILTY SAND, fine grained sand, moist, olive gray, no HCl reaction, homogenous structure	SM	-67.7				
142.5	142.5 - 177.5 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated <5% shells, weak HCl reaction, hard, homogenous structure, fine sand size highly weathered shells		-73.2		145	S-47, SPT 7+9+11 REC=18", 100%	
					150	S-48, SPT 7+10+11 REC=18", 100%	143.5 ft: driller de-sanded mud tub, driller flushed out boring with new drilling fluid; next day driller added ~ 50 gal of clean water to drilling fluid and cleaned out the hole
	148.5 ft: Changes to firm	ML				S-49, SPT 7+9+10 REC=18", 100%	148.5 - 153.5 ft: olive gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
					155		
						S-50, SPT 7+9+12 REC=18", 100%	
					160		
						S-51, SPT 7+9+10 REC=18", 100%	
					165		
						S-52, SPT 7+10+12 REC=18", 100%	
					170		
						S-53, SPT 8+9+11 REC=18", 100%	
					175		
						S-54, SPT 4+10+13 REC=18", 100%	
					180		
177.5	177.5 - 179.3 ft: SILTY SAND, fine grained sand, moist, olive gray, estimated <5% shells, weak HCl reaction, fine to medium sand size moderate to highly weathered shells	SM	-108.2				
179.3	179.3 - 187.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, olive gray and light gray, estimated 15 - 25% shells, fine sand to angular fine sand size, fresh to highly weathered shells, weak HCl reaction	SP-SM	-110.0				
							163.5 - 168.5 ft: uniform drilling resistance, smooth drilling
							173.5 - 178.5 ft: clumps of sandy silt and fine sand in cuttings
							178.5 - 179.3 ft: jar labeled as S-54A 178.5 ft: harder drilling 179.3 - 180.0 ft: jar labeled as S-54B

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	with shells, no HCl reaction with soil							
	183.5 ft: Changes to olive gray and gray, estimated <5% shells, homogenous structure, fine sand size highly weathered shells	SP-SM			185	S-55, SPT 7+10+14 REC=18", 100%		183.5 ft: driller rods clogged with sand, silt and shells, driller took off 35 ft of rods and flushed out the remaining rods
187.5	187.5 - 212.5 ft: SILTY SAND, fine grained sand, wet, olive gray, estimated <5% shells, weak HCl reaction, homogenous structure, fine sand size, highly weathered shells		-118.2		190	S-56, SPT 4+7+10 REC=18", 100%		188.5 - 193.5 ft: silty sand and fine sand cuttings
					195	S-57, SPT 5+7+11 REC=18", 100%		
		SM			200	S-58, SPT 6+8+10 REC=18", 100%		198.5 ft: driller desanded mud tub, added ~ 25 gals to drilling fluid and flushed hole with new drilling fluid
	203.0 ft: Changes to fine to medium sand size moderate to highly weathered shells				205	S-59, SPT 7+8+13 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	208.5 ft: Changes to fine sand size highly weathered shells	SM			210	S-60, SPT 7+9+12 REC=18", 100%		208.5 ft: marsh funnel test performed (41 sec drilling fluid)
212.5	212.5 - 250.0 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated <5% shells, weak HCl reaction, firm, homogenous structure, fine sand size highly weathered shells		-143.2		215	S-61, SPT 6+10+12 REC=18", 100%		
		ML			220	S-62, SPT 6+9+11 REC=18", 100%		
					225	S-63, SPT 6+9+11 REC=18", 100%		223.5 ft: driller emptied mud tub of all drilling fluid (too thick for pump), driller mixed 2 bags of bentonite with 150 gals of water (drilling fluid)
					230	S-64, SPT 6+10+15 REC=18", 100%		223.5 - 228.5 ft: light gray drilling fluid
					235	S-65, SPT 7+12+17 REC=18", 100%		228.5 - 233.5 ft: olive gray drilling fluid
								233.5 - 238.5 ft: slightly harder drilling

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-345**
Schnabel No.: 06120048
Sheet: 10 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
								233.5 - 238.5 ft: slightly harder drilling (continued)
					240	S-66, SPT 7+13+19 REC=18", 100%		238.5 - 243.5 ft: uniform drilling resistance, smooth drilling
					245	S-67, SPT 8+10+14 REC=18", 100%		
						S-68, SPT 6+10+15 REC=18", 100%		
250.0			180.7		250			

Bottom of Boring at 250.0 ft.
Boring backfilled with cuttings upon completion.

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-346
Schnabel No.: 06120048
Sheet: 1 of 5

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/1/08 **Finished:** 7/1/08

Easting: 960400.4 ft **Northing:** 217206.4 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 61.8 (ft) **Total Depth:** 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/1	10:27 AM	13.5'	13.5'	---
Completion	7/1	3:00 PM	8.6'	14.5'	81.0'

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.5	0.0 - 0.5 ft: Rootmat and topsoil		61.3			S-1, SPT 1+2+2 REC=9", 50%		0.0 ft: Advanced 4-1/4" I.D. HSA to 14.5 ft. 0.0 to 2.5 ft interval uniform drilling resistance, smooth drilling, brown outtings, changes as noted below. See end of boring log for additional remarks.
	0.5 - 7.0 ft: POORLY GRADED SAND, medium to coarse grained sand, subangular particles, moist, brown, no HCl reaction					S-2, SPT 1+2+3 REC=11", 61%		5.0 ft: Changes to estimated <5% lean clay
	2.0 ft: Changes to brown and light brown, estimated <5% fine gravel, contains roots, subangular gravel					S-3, SPT 2+2+2 REC=13", 72%		5.0 ft: Photograph for S-3 contains S-2 information
7.0	7.0 - 9.5 ft: POORLY GRADED SAND, medium to coarse grained sand, subangular particles, moist, light gray and orangish brown, estimated <5% fine gravel, no HCl reaction, angular gravel	SP	54.8			S-4, SPT 6+10+10 REC=11", 61%		7.5 - 10.0 ft: brownish orange cuttings
9.5	9.5 - 12.5 ft: SANDY LEAN CLAY, fine grained sand, moist, light gray with mottles of brownish orange, no HCl reaction, iron oxidation mottles	CL	52.3			S-5, SPT 1+2+3 REC=18", 100%		
12.5	12.5 - 17.0 ft: LEAN CLAY, moist, dark gray, contains mica, no HCl reaction	CL	49.3			S-6, SPT 2+4+4 REC=18", 100%		
17.0	17.0 - 24.0 ft: LEAN CLAY, moist, dark gray, contains mica, no HCl reaction, firm	CL	44.8			S-7, SPT 4+8+11 REC=18", 100%		14.5 ft: Switch to 3-1/2" O.D. tricone roller bit (mud rotary) and advanced to 100.0 ft, one bag of bentonite mixed with 125 gallons of water for mud mix 14.5 ft: Uniform drilling resistance, smooth drilling, gray drilling fluid.

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
24.0	24.0 - 27.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, no HCl reaction	CL	37.8		S-8, SPT 7+10+15 REC=18", 91%		23.5 - 24.0 ft: Jar labeled as S-8A 23.5 - 28.5 ft: Increasing drilling resistance with depth added mud thinner at 25.0 ft 24.0 - 25.0 ft: Jar labeled as S-8B
27.0	27.0 - 32.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated 5 - 10% shell fragments, coarse sand to fine gravel size fresh shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	34.8		S-9, SPT 19+50/5" REC=8", 74%		
32.0	32.0 - 39.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, light gray, estimated 5 - 10% shell fragments, coarse sand to medium gravel size fresh shell fragments, strong HCl reaction (with shells), strong HCl reaction, (with soil)	SP-SM	29.8		S-10, SPT 15+26+25 REC=14", 78%		33.5 - 38.5 ft: Uniform drilling resistance, smooth drilling
39.0	39.0 - 42.0 ft: LEAN CLAY, moist, dark gray, estimated <5% fine grained sand, estimated <5% shell fragments, contains mica, firm, fresh shell fragments, strong HCl reaction (with shells), strong HCl reaction (with soil)	CL	22.8		S-11, SPT 4+7+7 REC=18", 100%		38.5 - 39.0 ft: Jar labeled as S-11A 39.0 - 40.0 ft: Jar labeled as S-11B
42.0	42.0 - 48.0 ft: LEAN CLAY, moist, dark gray, estimated <5% fine grained sand, estimated <5% shell fragments, fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reactions (with soil)	CL	19.8		S-12, SPT 3+8+50 REC=18", 100%		46.0 - 48.0 ft: Bit chatter

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
48.0	48.0 - 52.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated <5% shell fragments, fine to medium gravel size fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	CL	13.8					46.0 - 48.0 ft: Bit chatter (continued)
		SP-SM			50	S-13, SPT 7+5+12 REC=18", 100%		48.5 - 53.5 ft: Uniform drilling resistance, smooth drilling, gray drilling fluid
52.0	52.0 - 57.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated 15 - 25% shell fragments, fine gravel size fresh shell fragments, strong HCl reaction (with shells) weak HCl reaction (with soil)	SP-SM	9.8					
					55	S-14, SPT 3+5+6 REC=4", 22%		
57.0	57.0 - 62.0 ft: POORLY GRADED SAND, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, contains 5 - 10 % fine to medium gravel, coarse sand to medium gravel size highly weathered shell fragments, gravel is cemented sand, strong HCl reaction (with shells)	SP	4.8					58.5 - 60.0 ft: Uniform drilling resistance, smooth drilling, gray drilling fluid
					60	S-15, SPT 27+15+12 REC=10", 56%		
62.0	62.0 - 67.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, Coarse sand to fine gravel size highly weathered shell fragments, weak HCl reaction (with shells), no HCl reactoin. (with soil)	SP-SM	-0.2					
					65	S-16, SPT 5+5+10 REC=18", 100%		
67.0	67.0 - 72.0 ft: SILTY SAND, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, fine gravel size highly weathered shell fragments, strong HCl reaction, (with shells), weak HCl reaction (with soil)	SM	-5.2					68.5 - 70.0 ft: Uniform drilling resistance, smooth drilling, gray drilling fluid
					70	S-17, SPT 5+6+8 REC=18", 100%		
72.0	72.0 - 77.0 ft: SILTY SAND, fine to medium grained sand, wet, estimated 5 - 10% shell fragments, Coarse sand to fine gravel size moderately to highly weathered shell fragments, strong HCl	SM	-10.2					
						S-18, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	reaction (with shells), weak HCl reaction (with soil)	SM			75	7+11+18 REC=18", 100%		
77.0	77.0 - 82.0 ft: CLAYEY SAND, fine to medium grained sand, wet, dark gray, estimated 15 - 25% shell fragments, fine to medium gravel size fresh shell fragments, contains a 2 inch layer of fine to coarse gravel, (as cemented sands) at 79.8 ft, strong HCl reaction (with shells), strong HCl reaction (with soil)	SC	-15.2		80	S-19, SPT 8+7+31 REC=18", 100%		78.5 - 83.5 ft: Uniform drilling resistance, smooth drilling, gray drilling fluid
82.0	82.0 - 87.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated <5% shell fragments, fine gravel size highly weathered shell fragments, weak HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-20.2		85	S-20, SPT 7+10+15 REC=18", 100%		
87.0	87.0 - 92.0 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, estimated <5% shell fragments, medium to coarse sand size highly weathered shell fragments, strong HCl reaction (with shells), strong HCl reaction (with soil)	CL	-25.2		90	S-21, SPT 10+17+10 REC=18", 100%		88.5 - 90.0 ft: Uniform drilling resistance, smooth drilling, gray drilling fluid
92.0	92.0 - 97.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, estimated <5% shell fragments, coarse sand to fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-30.2		95	S-22, SPT 5+8+11 REC=18", 100%		
97.0	97.0 - 100.0 ft: SILTY SAND, fine grained sand, moist, dark gray, weak HCl reaction	SM	-35.2			S-23, SPT 9+9+12 REC=18", 100%		
100.0			-38.2		100			

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-346**
Schnabel No.: 06120048
Sheet: 5 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
Bottom of Boring at 100.0 ft. Boring backfilled with bentonite and coment grouting using a tremie upon completion.								
DRAFT								



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-347
Schnabel No.: 06120048
Sheet: 1 of 11

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: M. Lark

Schnabel Representative: W. Bradfield

Equipment: CME-75 (ATV); AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger,
3 1/2" O.D. Tri-Cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/16/08 **Finished:** 7/23/08

Easting: 960531.8 **Northing:** 217214.2 **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 60.2 (ft) **Total Depth:** 200.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/16	---	11.0'	10.0'	---
Start of Day	7/17	7:20 AM	-0.7'	13.5'	13.9'
Start of Day	7/18	7:11 AM	7.8'	13.5'	---
Start of Day	7/21	8:35 AM	12.2'	13.5'	75.0'
Start of Day	7/22	7:04 AM	8.5'	13.5'	---
Start of Day	7/23	7:10 AM	7.0'	13.5'	---
Completion	7/23	10:40 AM	7.4'	13.5'	---

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.3	0.0 - 0.3 ft: Topsoil, roots		59.9			S-1, SPT 1+1+1 REC=14", 78%		0.0 - 2.5 ft: Advanced 6 1/4 inch I.D. HSA to 12.5 ft; 0.0 to 2.5 ft interval uniform drilling resistance, smooth drilling; changes as noted below; see end of boring log for additional remarks.
2.0	0.3 - 2.0 ft: SILTY SAND, fine to medium grained sand, moist, dark brown, estimated 15 - 25% roots, no HCl reaction 1.0 ft: Changes to light yellowish brown, estimated 5 - 10% roots	SM	58.2			S-2, SPT 2+2+5 REC=7", 39%		
4.5	2.0 - 4.5 ft: SANDY LEAN CLAY, fine to medium grained sand, moist, light yellowish brown with mottles of light gray, estimated <5% roots, no HCl reaction	CL	55.7		5	S-3, SPT 3+4+6 REC=13", 72%		
8.1	4.5 - 8.1 ft: SANDY LEAN CLAY, fine to medium grained sand, moist, light gray with bands of brownish orange, no HCl reaction, <1/4 inch layer of fine sand, layers are brownish orange. Contains 1 inch layer of lean clay with sand at 7.9 ft, moist, dark gray, no HCl, firm	CL	52.1			S-4, SPT 2+3+6 REC=14.5", 81%		
8.8	8.1 - 8.8 ft: SILTY SAND, fine to medium grained sand, moist, brownish olive with mottles of light gray	SM	51.4					7.5 - 8.1 ft: jar labeled as S-4A 8.1 - 8.8 ft: jar labeled as S-4B
9.5	8.8 - 9.5 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, no HCl reaction, firm	CL	50.7					
12.0	9.5 - 12.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, dark gray, estimated 5 - 10% silt, contains mica, no HCl reaction, 2 layers of sandy lean clay, dark gray from 10.0 - 10.1 ft and 3/4 inch thick layer at 11.4 ft	SP-SM	48.2		10	S-5, SPT 2+7+7 REC=16", 89%		12.5 ft: switched to 3 1/2 inch O.D. tricone roller bit (mud rotary) and advanced to 200 ft; mix 25 lbs bentonite with 100 gal water
14.5	12.0 - 14.5 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, contains mica, no HCl reaction, hard	CL	45.7			S-6, SPT 3+4+8 REC=18", 100%		
	14.5 - 17.0 ft: LEAN CLAY WITH	CL						

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04 22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
17.0	SAND, moist, dark gray, contains mica, no HCl reaction, hard	CL	43.2			S-7, SPT 4+7+9 REC=18", 100%		12.5 - 15.0 ft: uniform drilling resistance, smooth drilling, light brownish gray drilling fluid
17.0 - 20.3 ft	CLAYEY SAND, fine to medium grained sand, moist, dark gray, contains mica, no HCl reaction, homogenous structure	SC				S-8, SPT 3+3+4 REC=18", 100%		15.0 - 17.5 ft: Light gray drilling fluid
20.3	20.3 - 21.1 ft: SANDY LEAN CLAY, fine to medium grained sand, moist, dark gray, contains mica, no HCl reaction, hard	CL	39.9		20	S-9, SPT 3+7+11 REC=18", 100%		20.0 - 20.3 ft: jar labeled as S-9A
21.1	21.1 - 23.2 ft: CLAYEY SAND, fine to coarse grained sand, subrounded to subangular particles, moist, dark gray estimated <5% cemented sands, no HCl reaction (with soil), no HCl reaction (with cemented sands)	SC	39.1			S-10, SPT 9+16+50/5" REC=17", 94%		20.3 - 21.1 ft: jar labeled as S-9B
23.2	22.5 ft: Changes to coarse grained sand		37.0					21.1 - 21.5 ft: jar labeled as S-9C
23.2 - 27.0 ft	SILTY SAND, fine to coarse grained sand, subangular particles, moist, dark gray, estimated 15 - 25% cemented sands, estimated <5% shell fragments, moderate cementation, subangular fine gravel, highly weathered shell fragments, weak HCl reaction (with shells and cemented sands), no HCl reaction (with soil)	SM			25	S-11, SPT 36+47+42 REC=17", 94%		22.5 - 23.2 ft: jar labeled as S-10A
27.0	25.0 ft: Changes to coarse grained sand, angular particles, dark gray with light brownish white, estimated 15 - 25% shell fragments, estimated <5% cemented sands, strong cementation, coarse sand size moderately weathered to fresh shell fragments, no HCl reaction (with soil), strong HCl reaction (with shells), weak HCl reaction (with cemented sands)	SP-SM	33.2			S-12, SPT 40+50/4.5" REC=9.5", 53%		23.2 - 24.0 ft: jar labeled as S-10B
27.0 - 32.0 ft	POORLY GRADED SAND WITH SILT, fine and coarse grained sand, wet, dark gray with speckles of white, estimated 5 - 10% shell fragments, angular coarse sand, coarse sand sized highly to moderately weathered shell fragments, no HCl reaction (with shells), strong HCl reaction (with soil)				30	S-13, SPT 50+50/4" REC=9.5", 53%		23.5 ft: increased drilling resistance, harder drilling (possible cemented sand) added 25 lbs bentonite
32.0	30.0 ft: Changes to fine to medium grained sand, gray, estimated <5% shell fragments, medium sand sized moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	28.2			S-14, SPT 14+29+29 REC=11.5", 64%		25.0 - 30.0 ft: Hard drilling
32.0 - 39.5 ft	SILTY SAND, fine and coarse grained sand, angular particles, wet, gray, estimated 50 - 100% shell fragments, angular fine gravel,				35			30.0 ft: Added 25 lbs bentonite
								32.5 - 35.0 ft: Hard drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
39.5	brownish white and black shells, medium to coarse sand and fine gravel size moderately weathered to fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil) 35.0 ft: Changes to estimated 50 - 100% shell fragments, coarse sand sized 38.2 ft: Changes to moist, dark gray with light brownish white, estimated 15 - 25% shell fragments, medium to coarse sand and fine gravel sizes shell fragments, highly to moderately weathered shell fragments, weak to strong HCl reaction (with shells), no HCl reaction (with soil) 39.5 - 42.0 ft: SANDY SILT, fine grained sand, moist, dark greenish gray, contains mica, weak HCl reaction, homogenous structure	SM	20.7			S-15, SPT 13+14+15 REC=11.5", 64%		
						S-16, SPT 7+4+4 REC=17", 94%		37.5 - 38.2 ft: jar labeled as S-16A 38.2 - 39.0 ft: jar labeled as S-16B
					40	S-17, SPT 3+2+4 REC=18", 100%		39.0 ft: easier drilling with uniform drilling resistance 40.0 - 42.5 ft: Smooth drilling, sand
42.0	42.0 - 48.4 ft: SILTY SAND, fine to coarse grained sand, subangular to angular particles, moist, greenish gray, estimated 50 - 100% cemented sands, moderate cementation, no HCl reaction (with soil), no HCl reaction (with cemented sand), coarse sand and cemented sands fracture	SM	18.2			S-18, SPT 50/1.5" REC=1.5", 8%		42.5 - 45.0 ft: Very hard drilling with grinding/scraping slow penetration rate 42.5 ft: harder drilling with rig chatter
					45	S-19, SPT 50/4" REC=0", 0%		45.0 - 47.5 ft: Very hard drilling with rig chatter, slow penetration rate; at 46 ft, easier drilling, no chatter, slower penetration rate
48.4	47.5 ft: Changes to light brownish gray, estimated 15 - 25% shell fragments, angular fine gravel, with light brown and black coarse sand to fine gravel sized fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil) 48.1 ft: Changes to wet	SM	11.8			S-20, SPT 12+6+44 REC=18", 100%		47.5 - 50.0 ft: Intermittent (6") zones of hard drilling with rig chatter and easier drilling with little resistance, gray drilling fluid
50.8	48.4 - 50.8 ft: CLAYEY SAND, fine to coarse grained sand, angular to subrounded particles, moist, light gray and dark gray, estimated 30 - 45% shell fragments, organic odor, strong cementation, dark gray cemented sands, medium to coarse and fine gravel sized highly weathered to fresh shell fragments, strong HCl reaction (with soil), strong HCl reaction (with cemented sands), coarse sand and fine gravel sized cemented sands fracture 50.0 ft: Changes to angular particles, wet, gray with light brownish white, angular fine gravel, strong HCl reaction (with shells), no HCl reaction (with soil) 50.8 - 62.0 ft: SILTY SAND, fine to coarse grained sand, angular particles,	SM	9.4		50	S-21, SPT 4+3+4 REC=18", 100%		50.0 - 52.5 ft: Uniform drilling resistance, smooth drilling, gray drilling fluid 50.0 - 50.8 ft: jar labeled as S-12A 50.8 - 51.5 ft: jar labeled as S-12B
					55	S-22, SPT 3+4+4 REC=18", 100%		
						S-23, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	wet, dark gray with streaks of light brownish white, estimated 15 - 25% shell fragments, angular fine gravel, coarse sand to fine gravel sized moderately weathered to fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil) 52.5 ft: Changes to estimated 15 - 25% shell fragments, medium to coarse sand and fine to coarse gravel sized highly weathered to fresh shell fragments 55.0 ft: Changes to dark gray with brownish white, shell fragments 57.5 ft: Changes to angular to subrounded particles, dark gray with speckles of light brownish white, estimated 5 - 10% shell fragments 60.0 ft: Changes to angular particles, medium to coarse sand sized shell fragments	SM				6+6+8 REC=18", 100% S-24, SPT 3+3+6 REC=18", 100%		55.0 - 57.5 ft: Gray drilling fluid (continued)
62.0	62.0 - 69.5 ft: SILTY SAND, fine to coarse grained sand, wet, dark gray with speckles of light brownish white, estimated 5 - 10% shell fragments, medium to coarse sand sized highly weathered to fresh shell fragments, weak to strong HCl reaction (with shells), no HCl reaction (with soil) 65.0 ft: Changes to fine to medium grained sand, dark gray with speckles of white, highly weathered shell fragments, weak HCl reaction (shells), no HCl reaction (soil) 67.5 ft: Changes to gray with speckles of white, estimated <5% shell fragments, highly to moderately weathered shell fragments, weak to strong HCl reaction (with shells), no HCl reaction (with soil)	SM	-1.8		60	S-25, SPT 4+5+8 REC=18", 100%		60.0 - 62.5 ft: Uniform drilling resistance smooth drilling, gray drilling fluid,
					65	S-27, SPT 3+3+5 REC=18", 100%		
						S-28, SPT 2+3+3 REC=18", 100%		
69.5	69.5 - 72.0 ft: SANDY SILT, fine to coarse grained sand, angular particles, moist, gray with streaks of light brownish white, estimated 15 - 25% shell fragments, hard, subangular to angular fine gravel, medium to coarse sand and fine gravel sized highly weathered to fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil) 70.6 ft: Changes to estimated 30 - 45% shell fragments	ML	-9.3		70	S-29, SPT 4+5+10 REC=18", 100%		72.0 ft: increased resistance with rig chatter, slightly harder drilling 72.5 - 75.0 ft: Hard drilling with rig chatter (possibly cemented sands)
72.0	72.0 - 75.4 ft: SILTY SAND WITH GRAVEL, fine to coarse grained sand, subangular to angular particles, wet, gray with speckles of white, estimated 15 - 25% cemented sands, estimated 15 - 25% shell fragments, moderate cementation, subangular coarse gravel, coarse sand and coarse gravel as cemented sand, medium to coarse	SM	-11.8			S-30, SPT 50/4" REC=4", 22%		
75.4		SM	-15.2		75	S-31, SPT 42+9+6		75.0 - 75.4 ft: jar labeled as S-31A

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	sand sized shell fragments, strong HCl reaction (with shells and cemented sands) 75.0 ft: Changes to angular particles, light gray, angular fine gravel					REC=17.5", 97%		75.5 ft: drilling became easier, uniform drilling resistance, smooth drilling
	75.4 - 81.2 ft: SILTY SAND, fine to coarse grained sand, angular particles, wet, light gray with speckles of grayish white, medium to coarse sand and fine gravel sized highly weathered to fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SM				S-32, SPT 15+11+17 REC=17", 94%		75.0 - 77.5 ft: Hard drilling with slight rig chatter (continued)
	77.5 ft: Changes to angular to subrounded particles, wet, gray with streaks of white, estimated 15 - 25% shell fragments, estimated 5 - 10% cemented sands, coarse sand and fine gravel as cemented sands, strong HCl reaction (with cemented sands)				80	S-33, SPT 6+8+11 REC=16", 89%		75.4 - 76.5 ft: jar labeled as S-31B (continued)
81.2	81.2 - 84.5 ft: POORLY GRADED WITH SILT, fine to coarse grained sand, angular to subangular particles, wet, dark gray with speckles of white, estimated 5 - 10% shell fragments, medium to coarse sand sized highly to moderately weathered shell fragments, weak to strong HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-21.0					80.0 - 81.2 ft: jar labeled as S-33A
84.5	84.5 - 86.1 ft: SILTY SAND, fine to coarse grained sand, angular to subangular particles, moist, gray with streaks of brownish white, estimated 15 - 25% shell fragments, medium to coarse sand sized highly to moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-24.3		85	S-34, SPT 5+9+50/5.5" REC=17", 94%		81.2 - 81.5 ft: jar labeled as S-33B
86.1		SM	-25.9					85.0 - 90.0 ft: Harder drilling, rig chatter
87.0	86.1 - 87.0 ft: SILTY SAND WITH GRAVEL, fine to coarse grained sand, angular to subrounded particles, moist, gray with streaks of light brownish white, estimated 30 - 45% shell fragments, estimated 15 - 25% cemented sands, weak cementation, medium to coarse sand and fine gravel sized moderately weathered shell fragments, coarse sand and fine gravel sized cemented sands, strong HCl reaction (with shells and cemented sand), weak HCl reaction (with soil)	SM	-26.8		90	S-35, SPT 5+7+8 REC=18", 100%		85.0 - 86.1 ft: jar labeled as S-34A
	87.0 - 94.0 ft: SILTY SAND, fine grained sand, moist, gray with streaks of white, estimated <5% shell fragments, contains mica, highly weathered shell fragments weak HCl reaction (with shells), no HCl reaction (with soil), contains small (1/8 inch to 1/4 inch) pockets of silt throughout sample							86.1 - 86.5 ft: jar labeled as S-34B
94.0	94.0 - 98.5 ft: SANDY SILT, fine grained sand, moist, dark greenish gray with speckles of light brownish white, estimated <5% shell fragments, contains mica, hard, highly weathered shell fragments, strong HCl reaction	ML	-33.8		95	S-36, SPT 7+10+11 REC=18", 100%		87.0 ft: Drilling became easier
								95.0 ft: Add 20 lbs powdered bentonite to 20

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	(with shells), weak HCl reaction (with soil)	ML						gal water
98.5	98.5 - 114.0 ft: SILTY SAND, fine to coarse grained sand, angular particles, moist, dark greenish gray with streaks of light brownish white, estimated 5 - 10% shell fragments, contains mica, medium to coarse sand sized highly weathered to fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)		-38.3		100	S-37, SPT 4+7+9 REC=18", 100%		
	105.0 ft: Changes to subangular to angular particles, estimated 30 - 45% shell fragments	SM			105	S-38, SPT 5+7+11 REC=12", 67%		103.3 ft: Drilling became harder with rig chatter (possible shell fragments) 104.0 ft: Drilling became easier, uniform drilling resistance
	109.0 ft: Changes to highly to moderately weathered shell fragments				110	S-39, SPT 4+7+8 REC=18", 100%		110.0 - 115.0 ft: Light gray drilling fluid cuttings are silty sand
114.0	114.0 - 119.0 ft: SANDY SILT, fine grained sand, moist, dark greenish gray with speckles of light grayish white, estimated 5 - 10% shell fragments, hard, medium to coarse sand sized highly to moderately weathered shell fragments, strong HCl	ML	-53.8		115	S-40, SPT 6+8+12 REC=18", 100%		115.0 - 120.0 ft: gray drilling fluid

(continued)

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DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	reaction (with shells), weak HCl reaction (with soil)	ML					115.0 - 120.0 ft: gray drilling fluid (continued)
119.0	119.0 - 124.0 ft: SILTY SAND, fine grained sand, moist, olive gray with speckles of light brownish white, estimated <5% shell fragments, contains mica, highly weathered shell fragments, strong HCl reaction (with shells), strong HCl reaction (with soil)	SM	-58.8		120 S-41, SPT 5+8+8 REC=18", 100%		120.0 - 125.0 ft: Clumps of firm gravel and silty sand/silty sand with fine to coarse sized shell fragments in cuttings
124.0	124.0 - 129.0 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated <5% shell fragments, contains mica, firm, homogenous structure, medium sand sized highly weathered shell fragments, weak HCl reaction (with shells), weak HCl reaction (with soil)	ML	-63.8		125 S-42, SPT 4+5+8 REC=18", 100%		
129.0	129.0 - 134.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, homogenous structure	SM	-68.8		130 S-43, SPT 5+6+8 REC=18", 100%		
134.0	134.0 - 139.0 ft: SANDY SILT, fine grained sand, moist, olive gray with speckles of white, estimated <5% shell fragments, contains mica, firm, homogenous structure, highly to moderately weathered shell fragments, strong HCl reaction (with shells and soil)	ML	-73.8		135 S-44, SPT 5+6+10 REC=18", 100%		135.0 - 140.0 ft: Olive gray drilling fluid, sandy silt cuttings

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-347**
Schnabel No.: 06120048
Sheet: 8 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
139.0	139.0 - 169.0 ft: SANDY SILT, fine grained sand, moist, olive gray, firm, homogenous structure, contains manganese weak HCl reaction	ML	-78.8					135.0 - 140.0 ft: Olive gray drilling fluid, sandy silt cuttings (continued)
					140	S-45, SPT 6+8+12 REC=18", 100%		140.0 - 145.0 ft: Light olive gray drilling fluid
					145	S-46, SPT 5+8+10 REC=18", 100%		141.5 ft: Drilling mud consistently thinning out during drilling, pumped out all drilling fluid in mud tub and mixed a new batch of drilling mud (63 lbs. powered bentonite to 100 gal water)
	149.0 ft: Changes to olive gray, weak HCl reaction, firm	ML			150	S-47, SPT 6+7+10 REC=18", 100%		150.0 - 155.0 ft: silty sand and contain medium sand sized shell fragments in cuttings
					155	S-48, SPT 6+9+11 REC=18", 100%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-347**
Schnabel No.: 06120048
Sheet: 9 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
								155.0 - 160.0 ft: clumps of fine sandy silt/silty sand and some medium to coarse sized shell fragments in cuttings (continued)
					160	S-49, SPT 6+7+11 REC=18", 100%		160.0 - 165.0 ft: silty sand and some clumps of fine sand silt/bentonite and medium sized shell fragments in cuttings
					165	S-50, SPT 5+7+11 REC=18", 100%		165.0 - 170.0 ft: Some clumps of bentonite, silty sand and coated fine sandy silt/silty sand and medium to coarse sand sized shell fragments in cuttings
169.0	169.0 - 179.0 ft: SILTY SAND, fine to medium grained sand, moist, olive gray with streaks of light brownish white, estimated 5 - 10% shell fragments, contains mica, medium to coarse sized highly weathered to fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil) 170.8 ft: Changes to estimated 15 - 25% shell fragments, medium to fine gravel sized shell fragments, strong HCl reaction (with shells)	SM	-108.8		170	S-51, SPT 2+3+8 REC=18", 100%		170.0 - 175.0 ft: Easy drilling, softer drilling resistance
	175.0 ft: Changes to wet, dark olive gray with speckles of light brown, estimated 5 - 10% shell fragments, moderately weathered to fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)				175	S-52, SPT 4+6+10 REC=7.5", 42%		171.7 ft: Drilling becomes harder with uniform drilling resistance, light olive gray drilling fluid

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-347**
Schnabel No.: 06120048
Sheet: 10 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
179.0	179.0 - 197.5 ft: SILTY SAND, fine to medium grained sand, moist, grayish green, contains mica, no HCl reaction, homogenous structure	SM	-118.8		180	S-53, SPT 3+4+9 REC=18", 100%		175.0 - 180.0 ft: Uniform drilling resistance, smooth drilling, light olive gray drilling fluid, fine to medium sandy silt/silty sand clumps and medium to coarse sand sized shell fragments in cuttings (continued)
	185.0 ft: Changes to fine grained sand, weak HCl reaction	SM			185	S-54, SPT 4+7+12 REC=18", 100%		185.0 - 190.0 ft: fine to medium sand, clumps of fine sandy silt/silty sand and fine medium to coarse sand sized shell fragments in cuttings
					190	S-55, SPT 4+5+9 REC=16", 89%		
					195	S-56, SPT 5+6+10 REC=18", 100%		


(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-347**
Schnabel No.: 06120048
Sheet: 11 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
197.5	197.5 - 200.0 ft: SILTY SAND, fine grained sand, moist, grayish green with streaks of white, estimated <5% shell fragments, highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-137.3			S-57, SPT 4+7+9 REC=18", 100%		195.0 - 198.5 ft: fine to medium sand with some clumps of fine sandy silt/silty sand and trace amount of medium to coarse sand size shell fragments in cuttings (continued)
200.0		SM						

Bottom of Boring at 200.0 ft.

NOTE: Negative groundwater depth denotes water level above ground surface (i.e. "negative depth"), and does not necessarily imply artesian conditions.

DRAFT



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-348**
Schnabel No.: 06120048
Sheet: 1 of 11

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: M. Lark

Schnabel Representative: W. Bradfield

Equipment: CME-75 (ATV); AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/9/08 **Finished:** 7/16/08

Easting: 960568 ft **Northing:** 217149 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 68± (ft) **Total Depth:** 200.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/9	---	17.5'	14.5'	---
Start of Day	7/10	7:10 AM	0.0'	14.5'	---
Start of Day	7/11	7:27 AM	-3.9'	14.5'	---
Start of Day	7/14	10:09 AM	15.7'	14.5'	100.0'
Start of Day	7/15	7:18 AM	18.6'	14.5'	---
Completion	7/15	1:03 PM	11.4'	14.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.5	0.0 - 0.5 ft: Topsoil, forest litter, roots		67.4			S-1, SPT 2+1+1 REC=16", 89%		
3.5	0.5 - 3.5 ft: CLAYEY SAND, fine to medium grained sand, moist, yellowish red, estimated 5 - 10% roots, no HCl reaction	SC	64.4			S-2, SPT 1+2+4 REC=14", 78%		
7.0	3.5 - 7.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, yellowish red, no HCl reaction, lensed, contains 1/2" pockets of SILT (ML), moist, yellowish brown	SP-SM	60.9		5	S-3, SPT 2+7+8 REC=13", 72%		1.5 - 2.5 ft: advanced 6 1/4" OD HSA to 14.5 ft, uniform resistance, smooth drilling, changes as noted below. See end of boring log for additional remarks.
9.5	4.5 ft: Changes to light red, no HCl reaction, contains 3" layer of silty sand, moist, yellowish brown at 5 ft		58.4					2.5 - 3.5 ft: jar labeled as S-2A
10.3	7.0 - 9.5 ft: SILTY SAND, fine to medium grained sand, moist, dark yellowish brown with bands of yellowish brown, no HCl reaction, stratified, 1/8" to 1/4" alternating layers of yellowish brown and light gray	SM	57.6		10	S-4, SPT 2+3+4 REC=13", 72%		3.5 - 4.0 ft: jar labeled as S-2B
12.9	9.5 - 10.3 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, light red, no HCl reaction	SP-SM	55.0			S-5, SPT 5+5+6		6.0 ft: light red cuttings
14.5	10.3 - 12.9 ft: SANDY LEAN CLAY, fine to medium grained sand, moist, light gray and dark yellowish brown, no HCl reaction, soft, stratified, 1/8 to 1 inch alternating colors with bands of yellowish brown, light gray layers are lean clay, dark yellowish brown layers are more sandy	CL	53.4			S-6, SPT 2+2+4 REC=18", 100%		10.0 - 10.3 ft: jar labeled as S-5A
	12.0 ft: Changes to fine grained sand, gray with mottles of dark yellowish brown, soft, and light gray	MH						10.3 - 11.5 ft: jar labeled as S-5B
	12.9 - 14.5 ft: SANDY ELASTIC SILT, fine grained sand, moist, gray, contains mica, no HCl reaction, soft							
	14.5 - 17.0 ft: LEAN CLAY WITH	CL				S-7, SPT 2+3+5		12.5 - 12.9 ft: jar labeled as S-6A
								12.9 - 14.0 ft: jar labeled as S-6B
								13.5 ft: increased resistance, smooth drilling, light yellowish

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	SAND, fine grained sand, moist, gray, contains mica, no HCl reaction, firm, contains ~ 1/2" layer of poorly graded sand with clay, fine sand, moist, gray at 15.5 ft and 15.9 ft	CL				REC=18", 100%		red cuttings
17.0	17.0 - 18.0 ft: SANDY LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction, soft	CL	50.9					14.5 ft: switched to 3 1/2" OD tricone roller bit
18.0	18.0 - 18.4 ft: POORLY GRADED SAND WITH CLAY, fine to medium grained sand, wet, dark gray, contains mica, no HCl reaction	SP-SC	49.9			S-8, SPT 3+4+8 REC=18", 100%		caved rotary and advanced to 200.0 ft, uniform resistance, brownish gray drilling fluid
18.4	18.4 - 19.5 ft: SANDY LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction, firm	CL	49.5					14.5 - 16.0 ft: SPT Hammer Energy Test performed (continued)
19.5	19.5 - 22.0 ft: LEAN CLAY WITH SAND, fine grained sand, moist, dark gray, contains mica, no HCl reaction, hard	CL	48.4		20	S-9, SPT 3+5+6 REC=18", 100%		17.5 - 18.0 ft: jar labeled as S-8A
	22.0 - 24.5 ft: LEAN CLAY, moist, gray, estimated 5 - 10% fine grained sand, no HCl reaction, hard	CL	45.9					17.5 ft: light gray drilling fluid
24.5	24.5 - 29.5 ft: CLAYEY SAND, fine to medium grained sand, moist, gray, contains mica, no HCl reaction	SC	43.4		25	S-10, SPT 4+6+9 REC=18", 100%		18.0 - 18.4 ft: jar labeled as S-8B
	27.0 ft: Changes to fine to coarse grained sand, subrounded to subangular particles, weak cementation, coarse sand crumble	SC				S-11, SPT 3+3+4 REC=15.5", 86%		18.4 - 19.0 ft: jar labeled as S-8C
29.5	29.5 - 32.0 ft: SILTY SAND, fine to coarse grained sand, angular particles, moist, gray, estimated 5 - 10% cemented sands, cemented sands are fine to coarse gravel sized, angular, weak to strong cementation, coarse sand sized cemented sands crumble, fine to coarse gravel sized cemented sands fracture	SM	38.4		30	S-12, SPT 4+7+10 REC=18", 100%		
32.0	32.0 - 34.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, no HCl reaction, contains silty sand, fine to coarse sand, subrounded to angular coarse sand, wet, gray with brownish white, est 5 to 10% shell fragments, coarse sized shells moderately weathered shell fragments, est 5 to 10% cemented sands, cemented sands are coarse sand to fine gravel size, weak	SP-SM	35.9			S-13, SPT 10+23+43 REC=18", 100%		30.0 - 31.0 ft: SPT Hammer Energy Test performed
34.5		SM	33.4		35	S-14, SPT 19+23+30 REC=16", 89%		30.5 - 32.5 ft: increased resistance, light gray; thickened mud (add 25 lbs powdered bentonite)

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	to strong cementation, coarse sand sized cemented sands crumble, fine gravel sized cemented sands fracture.	SM				S-15, SPT 13+21+39 REC=18", 100%		35.0 ft: uniform resistance, smooth drilling
37.0	34.5 - 37.0 ft: SILTY SAND, fine to coarse grained sand, wet, gray with brownish white, estimated 15 - 25% shell fragments, coarse sand size moderate to highly weathered shell fragments; contains less than 1 inch layer of silt, moist, gray; weak to strong HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	30.9			S-16, SPT 34+44+44 REC=16", 89%		
39.5	37.0 - 39.5 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, wet, gray with brownish white, estimated 15 - 25% shell fragments, lensed, coarse sand size fresh to highly weathered shell fragments; contains less than 1/4 inch layer of silt, moist gray; weak to strong HCl reaction (with shells), no HCl reaction (with soil)	SM	28.4		40	S-17, SPT 18+24+39 REC=13", 72%		
42.0	39.5 - 42.0 ft: SILTY SAND, fine to medium grained sand, wet, gray with brownish white, estimated 15 - 25% shell fragments, lensed, moderate to highly weathered shell fragments; contains 1/4 to 3/4 inch of silt, moist gray; weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	25.9			S-18, SPT 32+34+24 REC=15", 83%		
45.0	42.0 - 45.0 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, wet, gray with brownish white, estimated 30 - 45% shell fragments, fresh to highly weathered coarse sand to fine gravel sized shell fragments; weak HCl reaction (with shells), no HCl reaction (with soil), strong HCl reaction with mechanically broken fresh shells.	SM	22.9		45	S-19, SPT 13+5+6 REC=18", 100%		44.0 - 45.0 ft: slight rig chatter
45.7	45.0 - 45.7 ft: SILTY SAND, fine to coarse grained sand, wet, light gray with brownish white, estimated 50 - 100% shell fragments, coarse sand to fine gravel sized fresh and moderately weathered shell fragments; weak HCl reaction (with shells), no HCl reaction (with soil), strong HCl reaction with mechanically broken fresh shells	MH	22.2			S-20, SPT 2+3+4 REC=18", 100%		45.0 - 46.5 ft: SPT Hammer Energy Test performed 45.0 ft: gray drilling fluid with sand and shells in cuttings 45.0 - 45.7 ft: jar labeled as S-19A 45.7 - 46.5 ft: jar labeled as S-19B
49.5	45.7 - 49.5 ft: SANDY ELASTIC SILT, fine to coarse grained sand, moist, gray with brownish white, estimated 5 - 10% shell fragments, firm, coarse sand size, moderately weathered to fresh, shell fragments; strong HCl reaction (with shells), no HCl reaction (with soil),	SM	18.4		50	S-21, SPT 50/5.5" REC=5.5", 46%		50.0 ft: harder drilling, minor grinding/scraping
52.0	47.5 ft: Changes to fine grained sand, estimated <5% shell fragments, medium sand sized moderately weathered shell fragments, no HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	15.9			S-22, SPT 50/5" REC=4", 22%		52.5 ft: hard drilling, slight grinding, trace cuttings
54.5	49.5 - 52.0 ft: SILTY SAND, fine to medium grained sand, moist, dark gray, estimated 30 - 45% cemented sands, no HCl reaction, coarse sand to coarse gravel sized; cemented sands moderate to strong cementation	SM	13.4		55	S-23, SPT		55.0 ft: no

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
57.0	52.0 - 54.5 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, moist, gray, estimated 30 - 45% cemented sands, estimated 5 - 10% shell fragments, moderately weathered shell fragments; coarse sand to coarse gravel sized cemented sands; no HCl reaction (with shells), no HCl reaction (with cemented sands), no HCl reaction (with soil), fragments; weak to strong cementation	SM	10.9			22+5+12 REC=18", 100%		cuttings
	54.5 - 57.0 ft: SILTY SAND, fine to coarse grained sand, wet, gray and light gray, with brownish white, est 15 - 25% cemented sands, est 5 - 10% shell fragments coarse sand to fine gravel sized, fresh to moderately weathered shell fragments; coarse sand to fine gravel size cemented sand, strong HCl reaction (with shells), no HCl reaction (with soil),	SP-SM			60	S-24, SPT 5+6+7 S-25, SPT 4+5+9 REC=16.5", 92%		57.5 ft: easier drilling, uniform resistance
62.0	57.0 - 62.0 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, wet, gray with white, estimated 30 - 45% shell fragments, coarse sand to fine gravel size fresh to highly weathered shell fragments; strong HCl reaction (with shells), no HCl reaction (with soil),	SM	5.9			S-26, SPT 6+14+11 REC=17", 94%		60.0 - 61.5 ft: SPT Hammer Energy Test performed
64.5	62.0 - 64.5 ft: SILTY SAND, fine to coarse grained sand, wet, gray with streaks of grayish white, estimated 15 - 25% shell fragments, estimated 5 - 10% cemented sands, coarse sand size; highly weathered to fresh shell fragments; coarse sand to fine gravel sized cemented sands; strong HCl reaction (with shells), weak HCl reaction (with cemented sands), no HCl reaction (with soil), weak to moderate cementation		3.4		65	S-27, SPT 4+4+5		62.5 - 65.0 ft: drilling and resistance alternated from hard to soft during run
	64.5 - 77.0 ft: SILTY SAND, fine to medium grained sand, wet, gray with speckles of brownish white, estimated 5 - 10% shell fragments, coarse sand size moderate to highly weathered shell fragment; strong HCl reaction (with shells), no HCl reaction (with soil)					S-28, SPT 4+5+8 REC=18", 100%		
	67.0 ft: Changes to gray, estimated <5% shell fragments, moderately weathered shell fragments, weak HCl reaction (with shells)	SM			70	S-29, SPT 4+4+7 REC=18", 100%		65.0 ft: uniform resistance, smooth drilling
	70.0 ft: Changes to no shell fragments							
	72.5 ft: Changes to estimated <5% shell fragments, no HCl reaction, highly weathered shell fragments					S-30, SPT 3+3+5 REC=18", 100%		72.5 - 75.0 ft: fine to medium sand cuttings, some coarse sand sized shell fragments in cuttings
	74.5 ft: Changes to gray with speckles of brownish white, estimated <5% shell fragments, moderate to highly weathered shell fragments				75	S-31, SPT 3+2+6		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
77.0	77.0 - 80.9 ft: CLAYEY SAND, fine to coarse grained sand, moist, gray with brownish white, estimated 5 - 10% shell fragments, coarse sand size highly weathered to fresh shell fragments; strong HCl reaction (with shells), no HCl reaction (with soil),	SM	-9.1			REC=18", 100%		75.0 - 76.5 ft: SPT Hammer Energy Test performed (continued)
80.9	79.5 ft: Changes to pinkish gray and light gray, with brownish white, est 30 - 45% shell fragments, est 5 - 10% cemented sands, coarse sand to fine gravel sized highly weathered to fresh shell fragments; cemented sands as coarse sand to coarse gravel fragments; strong HCl reaction (with shells), strong HCl (with cemented sands), no HCl reaction (with soil), moderate to strong cementation	SC	-13.0		80	S-31, SPT 4+5+12 REC=14", 78%		79.5 ft: slightly harder drilling 80.0 ft: some grinding 80.0 - 82.5 ft: stiffer resistance, slight rig chatter, light gray drilling fluid 80.0 - 80.6 ft: jar labeled as S-33A 80.9 - 81.5 ft: jar labeled as S-33B
	80.9 - 87.0 ft: SILTY SAND, fine to coarse grained sand, moist, pinkish gray and brownish white, estimated 50 - 100% shell fragments, estimated 30 - 45% cemented sands, coarse sand to coarse gravel size highly weathered to fresh shell fragments, cemented sands and coarse sand to fine gravel, strong HCl reaction (with shells), strong HCl reaction (with cemented sands), no HCl reaction (with soil), moderate to strong cementation	SM			85	S-34, SPT 31+14+9 REC=14", 78%		82.5 - 85.0 ft: alternating hard and easier drilling, slight grinding, gray drilling fluid
87.0	82.1 ft: Changes to estimated 15 - 25% cemented sands, weak to strong HCl reaction (with cemented sands), weak to moderate cementation; 82.5 ft: Changes to estimated 30 - 45% cemented sands, estimated 30 - 45% shell fragments, weak to strong HCl reaction (with cemented sands)	SM	-19.1			S-35, SPT 19+16+21 REC=14", 78%		85.0 ft: uniform resistance, smooth drilling
89.5	85.0 ft: Changes to wet, gray and light gray, est 5 - 10% cemented sand, est 15 - 25% shell fragments, fine gravel sized cemented sands; strong HCl reaction (with cemented sands),	SM	-21.6		90	S-36, SPT 9+12+15 REC=4", 22%		90.0 - 91.5 ft: SPT Hammer Energy Test performed
	87.0 - 89.5 ft: SILTY SAND, fine to medium grained sand, wet, gray, estimated <5% shell fragments, no HCl reaction, highly weathered shell fragments	SM			95	S-37, SPT 6+10+13 REC=18", 100%		
	89.5 - 98.0 ft: moist, gray with streaks of brownish white, estimated 15 - 25% shell fragments, coarse sand to fine gravel sized highly weathered to fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SM						93.0 ft: slightly harder drilling with rig chatter 93.5 ft: uniform resistance, smooth drilling
	93.0 ft: Changes to wet, gray, estimated <5% shell fragments, highly to moderately weathered shell fragments	SM				S-38, SPT 4+4+9 REC=18", 100%		

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-348
Schnabel No.: 06120048
Sheet: 6 of 11

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
98.0	98.0 - 108.0 ft: SANDY SILT, fine to medium grained sand, moist, gray, contains mica, moderate to highly weathered shell fragments; no HCl reaction (with shells), strong HCl reaction (with soil) with interbeds of silty sand, fine to medium sand, moist, gray; estimated < 5% shell fragments	SM	-30.1					
					100	S-39, SPT 6+9+14 REC=18", 100%		100.0 ft: gray drilling fluid
					105	S-40, SPT 5+4+8 REC=18", 100%		105.0 - 106.5 ft: SPT Hammer Energy Test performed
108.0	108.0 - 113.0 ft: SANDY SILT WITH GRAVEL, fine to coarse grained sand, wet, gray and white, estimated 50 - 100% shell fragments, estimated 15 - 25% cemented sands, subangular coarse gravel, coarse sand to coarse gravel size moderately weathered to fresh shell fragments; coarse gravel size cemented sands, strong HCl reaction (with shells), strong HCl reaction (with cemented sands), no HCl reaction (with soil), strong cementation, coarse gravel fracture	ML	-40.1					
					110	S-41, SPT 5+25/0" REC=6", 33%		110.0 - 111.6 ft: hard drilling, slow penetration with slight rig chatter (possible shells & cemented sands)
113.0	113.0 - 118.0 ft: SILTY SAND, fine to medium grained sand, moist, gray with speckles of white, estimated 5 - 10% shell fragments, moderately to highly weathered shell fragments, weak to strong HCl reaction (with shells), no HCl reaction (with soil)	SM	-45.1					
					115	S-42, SPT 3+5+9 REC=18", 100%		115.0 ft: smooth drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
118.0	118.0 - 123.0 ft: SANDY SILT, fine to medium grained sand, moist, olive gray, estimated <5% shell fragments, contains mica, strong HCl reaction, homogenous structure, moderately weathered shell fragments	SM	-50.1				
		ML			120 S-43, SPT 4+7+9 REC=18", 100%		120.0 - 121.5 ft: SPT Hammer Energy Test performed 120.0 - 125.0 ft: fine to medium sand, coarse sand sized shell fragments and som small (<1/4"> silt clumps in cuttings
123.0	123.0 - 128.0 ft: SANDY LEAN CLAY, fine to medium grained sand, moist, olive gray, contains mica, strong HCl reaction, homogenous structure	CL	-55.1		125 S-44, SPT 4+9+11 REC=18", 100%		
128.0	128.0 - 133.0 ft: CLAYEY SAND, fine to medium grained sand, moist, olive gray with streaks of white, estimated 15 - 25% shell fragments, moderately to highly weathered shell fragments, strong HCl reaction (in shells), weak HCl reaction (in soil)	SC	-60.1		130 S-45, SPT 4+4+5 REC=18", 100%		131.5 ft: approximately 30 ft of cave-in occurred over weekend, thickened bentonite drilling fluid (25 lbs)
133.0	133.0 - 140.8 ft: CLAYEY SAND, fine to medium grained sand, moist, olive gray, contains mica, no HCl reaction	SC	-65.1		135 S-46, SPT 8+10+15 REC=18", 100%		135.0 - 136.5 ft: SPT Hammer Energy Test performed

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
140.8	140.8 - 158.0 ft: SANDY LEAN CLAY, fine to medium grained sand, moist, olive gray, contains mica, weak HCl reaction, firm	SC	-72.9		140	S-47, SPT 4+5+10 REC=18", 100%		140.0 - 140.8 ft: jar labeled as S-47A 140.8 - 141.5 ft: jar labeled as S-47B
	145.0 ft: Changes to dark greenish gray				145	S-48, SPT 4+6+9 REC=18", 100%		145.0 - 150.0 ft: fine to medium sand size shell fragments, small ($<1/4$ ") clumps of clay in cuttings
	150.0 ft: Changes to grayish green, hard	CL			150	S-49, SPT 5+6+10 REC=18", 100%		150.0 - 151.5 ft: SPT Hammer Energy Test performed 150.0 - 155.0 ft: added ~ 2qts of "ThinZ-It" (Wyo-Ben) clay thinner to keep hole open and bit clean, driller slowed down drill rate
	155.0 ft: Changes to dark grayish green, strong HCl reaction				155	S-50, SPT 5+6+8 REC=18", 100%		155.0 - 160.0 ft: slightly darker mud (darker gray)

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
158.0	158.0 - 168.0 ft: SILTY SAND, fine to medium grained sand, moist, olive gray, contains mica, strong HCl reaction	CL	-90.1					155.0 - 160.0 ft: slightly darker mud (darker gray) (continued)
					160	S-51, SPT 5+8+10 REC=18", 100%		160.0 - 165.0 ft: with significant amount of clay in cuttings
					165			
168.0	168.0 - 179.0 ft: SILTY SAND, fine to medium grained sand, moist, olive gray, contains mica, strong HCl reaction	SM	-100.1					165.0 - 166.5 ft: SPT Hammer Energy Test performed
					170	S-53, SPT 6+7+10 REC=18", 100%		
					175	S-54, SPT 5+8+10 REC=18", 100%		
	173.0 ft: Changes to weak HCl reaction	SM						

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
179.0	179.0 - 185.0 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, wet, dark gray with speckles of brownish white, estimated 5 - 10% shell fragments, moderate to highly weathered shell fragments, strong HCl reaction (in shells), no HCl reaction (in soil)	SM	-111.1		180	S-55, SPT 7+10+14 REC=16", 89%		180.0 - 181.5 ft: SPT Hammer Energy Test performed 180.0 - 185.0 ft: intermittent smooth to slightly harder drilling (described by driller as "crunchy", possibly shell fragments), (added ~ 35 lbs of bentonite powder)
185.0	185.0 - 193.0 ft: SILTY SAND, fine to medium grained sand, wet, olive gray, estimated <5% shell fragments, contains mica, highly weathered shell fragments, weak HCl reaction (in shells), no HCl reaction (in soil)	SP-SM	-117.1		185	S-56, SPT 3+4+9 REC=17", 71%		185.0 - 186.0 ft: 140 ft of rods dropped in borehole, penetrated soil 16", pulled rods and drilled to 186.5 to take next sample 186.5 - 190.0 ft: fine to medium sand with clumps of clays/silt in cuttings
190.0	190.0 ft: Changes to no HCl reaction	SM			190	S-57, SPT 3+4+9 REC=18", 100%		
193.0	193.0 - 200.0 ft: SANDY ELASTIC SILT, fine to medium grained sand, moist, grayish green, contains mica, weak HCl reaction	MH	-125.1		195	S-58, SPT 4+6+14 REC=18", 100%		195.0 - 196.5 ft: SPT Hammer Energy Test performed

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-348**
Schnabel No.: 06120048
Sheet: 11 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
200.0		MH	-132.1		200	S-59, SPT 4+5+8 REC=9.5", 53%		

Bottom of Boring at 200.0 ft.
Boring backfilled with cement/bentonite grout upon completion.

DRAFT

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-349**
Schnabel No.: 06120048
Sheet: 1 of 5

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo)

Method: 4-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-Cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/1/08 Finished: 7/2/08

Easting: 960537.5 ft Northing: 217396.4 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 54.4 (ft) Total Depth: 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/1	5:45 PM	5.0'	5.0'	---
End of Day	7/1	6:40 PM	4.4'	9.5'	---
Start of Day	7/2	7:15 AM	4.5'	9.5'	---
Completion	7/2	12:50 PM	16.0'	9.5'	52.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.0 - 1.5 ft	ORGANIC SOIL					S-1, SPT 1+1+2 REC=15", 83%		0.0 - 2.5 ft: Advanced 4 1/4 inch I.D. HSA to 9.5 ft 0.0 to 2.5 ft interval uniform resistance, smooth drilling, light brown cuttings, used pilot bit to clear augers. Changes as noted below. See end of boring log for additional remarks
1.5			52.9					
2.0	1.5 - 2.0 ft: SILTY SAND, medium to coarse grained sand, subangular particles, moist, brown, estimated <5% fine gravel, no HCl reaction	SM	52.4			S-2, SPT 2+4+6 REC=15", 83%		5.0 - 7.5 ft: orangish brown cuttings
4.5	2.0 - 4.5 ft: POORLY GRADED SAND, fine to coarse grained sand, subrounded particles, moist, dark gray and brownish orange, estimated <5% fine gravel, estimated <5% clay, no HCl reaction, subrounded gravel	SP	49.9		5	S-3, SPT 3+4+3 REC=15", 83%		5.0 - 6.1 ft: jar labeled as S-3A
6.1	4.5 - 6.1 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, reddish orange and light gray, with bands of reddish orange, no HCl reaction	SP-SM	48.3			S-4, SPT 1+2+5 REC=18", 100%		6.1 - 6.5 ft: jar labeled as S-3B
	6.1 - 12.5 ft: LEAN CLAY, moist, dark gray, contains mica, no HCl reaction, soft	CL			10	S-5, SPT 2+5+6 REC=18", 100%		7.8 ft: dark gray cuttings
12.5	7.5 ft: Changes to firm		41.9			S-6, SPT 2+4+6 REC=18", 100%		9.5 ft: switch to 3 1/2 inch O.D. tricone roller bit (mud rotary) and advanced to 100 ft, one bag bentonite mixed with 125 gallons of water
	12.5 - 17.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, contains mica, no HCl reaction	SP-SM			15			9.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
17.5	17.5 - 22.5 ft: SILTY SAND, fine grained sand, moist, dark gray, estimated 5 - 10% fine to coarse gravel, no HCl reaction, moderate cementation, gravel as cemented sand fragments	SM	36.9			S-7, SPT 50/5" REC=5", 104%		10.0 - 13.5 ft: large pieces of lean clay cuttings

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
		SM					18.5 - 23.5 ft: increased resistance (continued)
22.5	22.5 - 27.0 ft: POORLY GRADED SAND, fine to coarse grained sand, subrounded particles, wet, dark gray, estimated <5% shell fragments, coarse sand size moderately to highly weathered shell fragments, strong HCl reaction (with shells), strong HCl reaction (with soil)	SP	31.9		S-8, SPT 50/5" REC=5", 100%		23.5 - 28.5 ft: uniform drilling resistance, gray drilling fluid
27.0	27.0 - 32.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated 15 - 25% shell fragments, fine to medium gravel size fresh shell fragments, strong HCl reaction (with shells), strong HCl reaction (with soil)	SP-SM	27.4		S-9, SPT 29+34+19 REC=15", 83%		28.5 - 33.5 ft: gradual decrease in drilling resistance, smooth drilling
32.0	32.0 - 37.0 ft: SILTY SAND, fine grained sand, moist, dark gray, estimated <5% shell fragments, medium to coarse gravel size highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SM	22.4		S-10, SPT 4+5+6 REC=18", 100%		33.5 - 38.5 ft: uniform drilling resistance
37.0	37.0 - 42.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, estimated <5% shell fragments, strong cementation, fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	17.4		S-11, SPT 16+50/4" REC=9", 94%		38.5 - 43.5 ft: resistance increased and decreased intermittently with bit chatter when drilling resistance increased (possible shells)
42.5	42.5 - 47.0 ft: SILTY SAND, fine to medium grained sand, wet, dark gray, estimated 5 - 10% shell fragments, coarse sand to fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	11.9		S-12, SPT 7+6+11 REC=18", 100%		43.5 - 48.5 ft: uniform drilling resistance, smooth drilling

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-349
Schnabel No.: 06120048
Sheet: 3 of 5

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
47.0	47.0 - 57.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated 5 - 10% shell fragments, fine to medium gravel size fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	7.4					
					50	S-13, SPT 7+7+10 REC=18", 100%		
	53.5 ft: Changes to estimated <5% shell fragments				55	S-14, SPT 4+5+8 REC=14", 78%		53.5 - 58.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
57.0	57.0 - 62.0 ft: POORLY GRADED, fine to medium grained sand, wet, dark gray, estimated <5% silt, estimated <5% shell fragments, coarse sand size highly weathered shell fragments, no HCl reaction (with shells), no HCl reaction (with soil)	SP	-2.6		60	S-15, SPT 5+5+7 REC=18", 100%		
62.0	62.0 - 67.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, dark gray, estimated <5% shell fragments, fine gravel size highly weathered shell fragments, contains mica, weak HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-7.6		65	S-16, SPT 5+5+9 REC=12", 67%		63.5 - 68.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
67.0	67.0 - 72.0 ft: SILTY SAND, fine to medium grained sand, wet, gray, estimated 5 - 10% shell fragments, estimated <5% fine gravel, strong cementation, coarse sand to medium gravel size highly weathered shell fragments, gravel as cemented sand, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-12.6		70	S-17, SPT 10+10+11 REC=18", 100%		
72.0	72.0 - 87.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated <5% shell fragments, fine to coarse gravel size highly weathered shell fragments,	SP-SM	-17.6			S-18, SPT		

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-349**
Schnabel No.: 06120048
Sheet: 4 of 5

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04 22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	strong HCl reaction (with shells), weak HCl reaction (with soil)				75	11+12+17 REC=18", 100%		73.5 - 78.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid (continued)
	78.5 ft: Changes to moist				80	S-19, SPT 13+10+10 REC=18", 100%		
	83.5 ft: Changes to wet, estimated <5% shell fragments, no HCl reaction, coarse sand to fine gravel size moderately to highly weathered shell fragments,	SP-SM			85	S-20, SPT 9+10+15 REC=18", 100%		83.5 - 88.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
87.0	87.0 - 92.5 ft: SILTY SAND, fine grained sand, moist, dark gray, estimated <5% shell fragments, fine gravel size highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SM	-32.6		90	S-21, SPT 6+10+15 REC=18", 100%		
92.5	92.5 - 97.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, estimated <5% shell fragments, coarse sand to fine gravel size highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil).	SP-SM	-38.1		95	S-22, SPT 8+8+11 REC=18", 100%		93.5 - 98.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
97.0	97.0 - 100.0 ft: POORLY GRADED SAND WITH SILT, moist, dark gray, estimated <5% shell fragments, fine to coarse gravel size fresh to highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-42.6			S-23, SPT 6+12+50 REC=18", 100%		
100.0			-45.6		100			

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-349**
Schnabel No.: 06120048
Sheet: 5 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		

Bottom of Boring at 100.0 ft.
Boring backfilled with bentonite and cement grout using a tremie upon completion.

DRAFT

**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-350**
Schnabel No.: 06120048
Sheet: 1 of 6

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates **Started:** 6/30/08 **Finished:** 6/30/08

Easting: 960789 ft **Northing:** 217516.2 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 46.6 (ft) **Total Depth:** 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	6/30	4:09 PM	13.5'	13.5'	---
Completion ▽	6/30	7:11 PM	10.0'	14.5'	20.5'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
0.0 - 1.0 ft: Topsoil, contains roots					S-1, SPT 2+1+2 REC=7", 39%		0.0 - 2.5 ft: Advanced 4 1/4" I.D. HSA to 14.5 ft; Uniform drilling resistance, smooth drilling, brown cuttings, used pilot bit; changes noted below
1.0	1.0 - 2.0 ft: SILTY SAND, fine to medium grained sand, moist, brown, contains roots, no HCl reaction	SM	45.6				
2.0	2.0 - 4.5 ft: SANDY LEAN CLAY, fine grained sand, moist, brown, contains roots, no HCl reaction	CL	44.6		S-2, SPT 2+4+6 REC=14", 78%		
4.5	4.5 - 7.0 ft: LEAN CLAY, moist, light gray with bands of brownish orange, estimated <5% fine grained sand, no HCl reaction, Iron oxidation bands	CL	42.1		S-3, SPT 2+5+6 REC=17", 94%		
7.0	7.0 - 9.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, light gray with bands of brownish orange, no HCl reaction, Iron oxidation bands	SP-SM	39.6		S-4, SPT 1+3+5 REC=16", 89%		7.5 - 9.0 ft: orangish brown cuttings
9.5	9.5 - 12.5 ft: SILTY SAND, fine grained sand, moist, light brown with bands of brownish orange, no HCl reaction, Iron oxidation bands	SM	37.1		S-5, SPT 4+5+5 REC=18", 100%		10.0 - 13.5 ft: brown cuttings
12.5	12.5 - 17.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, orangish brown and light gray, no HCl reaction	SP-SM	34.1		S-6, SPT 2+2+2 REC=10", 56%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
17.0	17.0 - 22.5 ft: POORLY GRADED SAND, fine to medium grained sand, wet, orangish brown, estimated <5% silt, no HCl reaction	SP-SM	29.6					14.5 - 18.5 ft: Switch to 3 1/2" O.D. tricone roller bit (mud rotary) and advance to 100 ft, one bag of bentonite mixed with about 125 gallons of water to make drilling fluid. Uniform drilling resistance, smooth drilling, gray drilling fluid (continued)
22.5	22.5 - 28.0 ft: SILTY SAND, fine grained sand, wet, dark gray, contains mica, estimated 15 - 25% shell fragments, coarse sand size fresh shells, strong HCl reaction (with shells and soil)	SP	24.1		20	S-7, SPT 6+2+3 REC=11", 61%		18.5 - 23.5 ft: brownish gray drilling fluid.
28.0	28.0 - 32.0 ft: SILTY SAND, wet, dark gray, contains mica, no HCl reaction	SM	18.6		25	S-8, SPT 4+6+5		23.5 - 28.5 ft: gray drilling fluid
32.0	32.0 - 36.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, contains cemented sands, coarse sand size fresh shells, strong HCl reaction (with shells and soil), moderate cementation	SM	14.6		30	S-9, SPT 10+10+25 REC=18", 100%		28.0 ft: increased drilling resistance 28.5 - 33.5 ft: Uniform drilling resistance, smooth drilling
		SP-SM			35	S-10, SPT 50/5" REC=5", 104%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
36.5	36.5 - 47.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated 5 - 10% shell fragments, coarse sand to coarse gravel size moderately weathered shells, strong HCL reaction (with shells), weak HCL reaction (with soil)	SP-SM	10.1					36.5 ft: decreased drilling resistance
					40	S-11, SPT 4+5+6		
					45	S-12, SPT 5+5+8 REC=16", 89%		38.5 - 43.5 ft: Uniform drilling resistance, smooth drilling
47.0	47.0 - 52.0 ft: POORLY GRADED SAND, fine grained sand, wet, dark gray, estimated <5% silt, estimated <5% shell fragments, coarse sand size moderately weathered shell fragments, weak HCL reaction (with shells and soil)	SP	-0.4					
					50	S-13, SPT 3+4+6 REC=17", 94%		
52.0	52.0 - 58.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, contains mica, estimated <5% shell fragments, strong HCL reaction (with shells and soil), highly weathered shell fragments	SP-SM	-5.4					
					55	S-14, SPT 2+4+7 REC=18", 100%		

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-350
Schnabel No.: 06120048
Sheet: 4 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
58.0	58.0 - 63.0 ft: CLAYEY SAND WITH GRAVEL, fine to medium grained sand, wet, light gray, contains cemented sands, estimated 5 - 10% shell fragments, fine gravel size fresh shell fragments, gravel as cemented sand, strong HCL reaction (with shells and soil)	SP-SM	-11.4					58.0 ft: increased drilling resistance and bit chatter
63.0	63.0 - 66.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated 5 - 10% fine to medium gravel, estimated <5% shell fragments, highly weathered shell fragments, gravel as cemented sands, strong HCL reaction (with shells and soil)	SC	-16.4					63.0 ft: bit chatter
66.0	66.0 - 72.0 ft: POORLY GRADED SAND, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, fine to coarse gravel size highly weathered shell fragments, strong HCL reaction (with shells), weak HCL reaction (with soil)	SP-SM	-19.4					66.0 ft: decreased drilling resistance
72.0	72.0 - 77.0 ft: SILTY SAND, fine grained sand, moist, dark gray, estimated 5 - 10% shell fragments, coarse sand to coarse gravel size moderately weathered to fresh shell fragments, strong HCL reaction (with shells and soil)	SP	-25.4					68.5 - 73.5 ft: uniform drilling resistance, smooth drilling
		SM						73.5 - 78.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04 22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
77.0	77.0 - 82.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, estimated <5% shell fragments, fine to coarse gravel size highly weathered shell fragments, strong HCL reaction (with shells), no HCL reaction (with soil)	SM	-30.4					73.5 - 78.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid (continued)
		SP-SM			80	S-19, SPT 6+8+12 REC=18", 100%		
82.0	82.0 - 92.0 ft: SILTY SAND, fine grained sand, moist, dark gray, no HCL reaction	SM	-35.4					83.5 - 88.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
					85	S-20, SPT 8+8+12 REC=18", 100%		
	88.5 ft: Changes to estimated <5% shell fragments, fine to coarse gravel size highly weathered shell fragments, strong HCL reaction (with shells), no HCL reaction (with soil)	SM						
					90	S-21, SPT 7+11+12 REC=18", 100%		
92.0	92.0 - 97.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, estimated 5 - 10% shell fragments, fine to coarse gravel size fresh to moderately weathered shell fragments. strong HCL reaction (with shells), weak HCL reaction (with soil)	SP-SM	-45.4					93.5 - 98.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
					95	S-22, SPT 9+9+16 REC=18", 100%		

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-350**
Schnabel No.: 06120048
Sheet: 6 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
97.0	97.0 - 100.0 ft: SILTY SAND, fine grained sand, moist, dark gray, contains mica, estimated <5% shell fragments, coarse sand and fine to coarse gravel size moderately to highly weathered shell fragments, strong HCl reaction (with shells and soil)	SP-SM	-50.4					93.5 - 98.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid (continued)
100.0		SM	-53.4		100	S-23, SPT 7+10+13 REC=18", 100%		

Bottom of Boring at 100.0 ft.

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

DRAFT

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-351
Schnabel No.: 06120048
Sheet: 1 of 6

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 6/24/08 **Finished:** 6/25/08

Easting: 960538.1 ft **Northing:** 217072.7 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 71.3 (ft) **Total Depth:** 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	6/24	---	58.5'	14.5'	---
Completion	6/25	5:20 PM	13.0'	14.5'	22.2'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.5	0.0 - 0.5 ft: Rootmat and topsoil		70.8			S-1, SPT 1/12"+3 REC=14", 78%		0.0 - 2.5 ft: Advanced 4-1/4" ID HSA to 14.5 ft, uniform resistance, smooth drilling, orangish brown cuttings; changes as noted below
1.5	0.5 - 1.5 ft: SANDY LEAN CLAY, fine grained sand, moist, brown, estimated <5% fine gravel, no HCl reaction, soft, subrounded fine gravel	CL	69.8					
	1.5 - 7.5 ft: SILTY SAND, fine grained sand, moist, orangish brown with bands of reddish brown, no HCl reaction, contains 1-inch layer of subrounded fine gravel at 3.6 feet, contains iron oxidation banding	SM				S-2, SPT 4+10+13 REC=18", 100%		
	5.0 ft: Changes to fine to medium grained sand, estimated <5% fine gravel, subrounded fine gravel				5	S-3, SPT 2+4+3 REC=13", 72%		5.0 - 7.5 ft: pilot bit used to clear auger plug
	6.0 ft: Changes to light gray 6.1 ft: Changes to orangish brown							
7.5	7.5 - 8.0 ft: LEAN CLAY, moist, light gray, no HCl reaction, soft, contains a 1-inch layer of fine sand at 7.7 feet, contains a 0.5-inch layer of cemented sand at 7.9 feet (possibly iron oxidation cementation)	CL	63.8			S-4, SPT 2+3+3 REC=18", 100%		7.5 - 10.0 ft: Advanced 4-1/4" I.D. HSA, increased drilling resistance at 9.0 ft, cuttings changed to dark gray
8.0		CL	63.3					
9.0	8.0 - 9.0 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, contains mica, no HCl reaction, firm, contains 1/8-inch layer of silty sand, moist, orangish brown at 8.4 ft 8.4 ft: Changes to orangish gray	CL	62.3					10.0 - 12.5 ft: Increased drilling resistance with depth, dark gray cuttings
	9.0 - 12.5 ft: LEAN CLAY, moist, dark gray, estimated <5% fine grained sand, no HCl reaction, firm	CL			10	S-5, SPT 3+3+4 REC=18", 100%		
12.5	12.5 - 15.0 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, contains mica, no HCl reaction, firm	CL	58.8			S-6, SPT 2+4+4 REC=18", 100%		12.5 - 14.5 ft: Uniform drilling resistance
								14.5 - 15.0 ft:

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-351**
Schnabel No.: 06120048
Sheet: 2 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
15.0	15.0 - 18.5 ft: LEAN CLAY WITH SAND, fine grained sand, moist, dark gray, contains mica, no HCl reaction, firm	CL	56.3			S-7, SPT 2+2+3 REC=17", 94%		Switched to 3-1/2" tricone roller bit (mud rotary) and advanced to 100 ft, uniform drilling resistance, smooth drilling, dark gray drilling fluid
18.5	18.5 - 28.5 ft: LEAN CLAY, moist, dark gray, contains mica, estimated <5% fine grained sand, no HCl reaction, firm, contains 2-inch layer of sandy lean clay (CL), moist, dark gray at 23.5 ft		52.8		20	S-8, SPT 3+4+6 REC=18", 100%		
		CL			25	S-9, SPT 6+8+10 REC=18", 100%		23.5 - 28.5 ft: Uniform drilling resistance, smooth drilling, light gray drilling fluid
28.5	28.5 - 33.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, contains mica, no HCl reaction	SP-SM	42.8		30	S-10, SPT 7+8+11 REC=18", 100%		28.5 - 33.5 ft: Increased drilling resistance at 33.0 ft
33.0	33.0 - 98.5 ft: SILTY SAND WITH SILT AND GRAVEL, fine to medium grained sand, moist, dark gray, estimated <5% shell fragments, weak HCl reaction (with shells)	SM	38.3		35	S-11, SPT 28+50/5" REC=12", 67%		33.5 - 38.5 ft: Uniform drilling resistance, smooth drilling, dark gray drilling fluid

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
								53.5 - 58.5 ft: Bit chatter from 56.5 to 57.0 ft (possible shell fragments/cemented sand), dark gray drilling fluid (continued)
	58.5 ft: Changes to wet, olive gray, strong HCl reaction (with shells), no HCl reaction (with soil), no cementation				60	S-16, SPT 6+8+10 REC=18", 100%		58.5 - 63.5 ft: Uniform drilling resistance, smooth drilling, dark gray drilling fluid
	63.5 ft: Changes to estimated <5% shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)				65	S-17, SPT 8+6+7 REC=18", 100%		63.5 - 68.5 ft: Uniform drilling resistance, smooth drilling, dark gray drilling fluid
		SM			70	S-18, SPT 7+7+10 REC=18", 100%		
	73.5 ft: Changes to no HCl reaction				75	S-19, SPT 5+7+11 REC=18", 100%		73.5 - 78.5 ft: Uniform drilling resistance, smooth drilling, dark gray drilling fluid

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-351**
Schnabel No.: 06120048
Sheet: 5 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
								73.5 - 78.5 ft: Uniform drilling resistance, smooth drilling, dark gray drilling fluid (continued)
	78.5 ft: Changes to estimated 15 - 25% shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)				80	S-20, SPT 10+50/5" REC=11", 100%		78.5 - 83.5 ft: Bit chatter from 81.0 to 81.5 ft
	83.5 ft: Changes to gray				85	S-21, SPT 8+31+29 REC=18", 100%		83.5 - 88.5 ft: Bit chatter from 84.0 to 84.3 ft, dark gray drilling fluid
	88.5 ft: Changes to estimated <5% shell fragments, weak HCl reaction				90	S-22, SPT 7+12+17 REC=18", 100%		88.5 - 93.5 ft: Uniform drilling resistance
	93.5 ft: Changes to contains shell fragments, contains 0.5-inch layer of shells at 94.2 ft, contains a 2.5-inch layer of shells at 94.4 feet, strong HCl reaction (with shells), weak HCl reaction (with soil)				95	S-23, SPT 9+14+18" REC=18", 100%		

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-351**
Schnabel No.: 06120048
Sheet: 6 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
98.5	98.5 - 100.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray, no HCl reaction	SM	-27.2		100	S-24, SPT 10+11+18 REC=18", 100%		
100.0		SP-SM						

Bottom of Boring at 100.0 ft.

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

DRAFT



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-352**
Schnabel No.: 06120048
Sheet: 1 of 8

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: K. Bell

Equipment: CME- 95 (Truck); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-3/4" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/21/08 Finished: 7/24/08

Easting: 216829 ft Northing: 960894.7 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 110.2 (ft) Total Depth: 200.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/21	4:10 PM	18.5'	14.0'	---
End of Day	7/21	6:15 PM	-1.0'	14.0'	---
Start of Day	7/22	8:30 AM	9.0'	14.0'	---
End of Day	7/22	6:00 PM	1.0'	14.0'	---
Start of Day	7/23	7:00 AM	15.5'	14.0'	---
Completion	7/23	5:30 PM	12.5'	14.0'	---
End of Day	7/23	6:00 PM	12.5'	14.0'	---

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	Start of Day STRATUM	7/24 SAMPLING DEPTH DATA	7:30 AM 37.0' 14.0' TESTS	REMARKS
0.0 - 2.0	FILL, sampled as silty sand, fine to medium grained sand, moist, orangish brown, estimated <5% roots, contains mica, no HCl reaction	FILL	108.2		S-1, SPT 4+9+6 REC=18", 100%		0.0 - 2.5 ft: Advanced 4 1/4" ID HSA to 14 ft; Uniform drilling resistance, easy drilling, orangish brown; changes as noted below, see end of boring log for additional remarks
2.0 - 3.5	POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, orangish brown, contains mica, no HCl reaction	SP-SM	106.7		S-2, SPT 2+1+2 REC=16", 89%		2.5 - 3.5 ft: Jar labeled as S-2A
3.5 - 4.5	POORLY GRADED SAND, fine grained sand, moist, yellowish brown, estimated <5% silt, no HCl reaction	SP	105.7		S-3, SPT 4+5+7 REC=15", 83%		3.5 - 4.0 ft: Jar labeled as S-2B
4.5 - 7.0	POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, brown and orangish brown, contains mica, no HCl reaction, contains a 3.5 inch layer of POORLY GRADED SAND (SP), fine sand, moist, orangish brown and yellowish brown, contains mica	SP-SM	103.2		S-4, SPT 12+16+21 REC=13.5", 75%		5.0 - 7.5 ft: Harder drilling near the bottom of the run
7.0 - 10.8	POORLY GRADED SAND, fine to coarse grained sand, subrounded particles, moist, yellowish brown and orangish brown, estimated <5% fine gravel, contains mica, no HCl reaction, stratified, subrounded to rounded fine gravel, contains layers of poorly graded sand with silt, 0.5 to 1.0 inch thickness	SP	99.4		S-5, SPT 14+17+13 REC=16", 89%		7.5 - 10.0 ft: Hard drilling (possible sand), orangish brown and yellowish brown cuttings
10.8 - 17.0	Changes to gray and yellowish brown, estimated <5% silt, estimated <5% coarse gravel, no HCl reaction, subrounded to rounded gravel	SC	93.2		S-6, SPT 7+6+6 REC=18", 100%		10.0 - 10.8 ft: Jar labeled as S-5A
17.0 - 22.0	CLAYEY SAND, fine to coarse grained sand, subrounded to subangular particles, moist, yellowish brown and brown, estimated <5% fine gravel, no HCl reaction, subangular to subrounded gravel	SP-SM			S-7, SPT 8+8+6 REC=10", 56%		10.0 - 13.5 ft: Uniform drilling resistance, hard drilling
	Changes to coarse grained sand, subrounded particles, orangish brown, medium to coarse sand from 14.1 to 14.4 ft						10.8 - 11.5 ft: Jar labeled as S-5B
	POORLY GRADED SAND WITH SILT, fine to coarse grained sand, subrounded particles, wet, yellowish brown and orangish brown, estimated 5 - 10% fine gravel, no HCl reaction, subrounded fine gravel						13.5 - 14.0 ft: orangish brown cuttings
							14.0 ft: Switched to 3 3/4" OD Tricone Roller bit (mud rotary) and advanced to 200 ft; driller mixed 2 bags of bentonite with 150 gallons of clean water; uniform drilling resistance, hard drilling
							18.5 ft: Poorly graded sand with

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-352
Schnabel No.: 06120048
Sheet: 2 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
22.0	22.0 - 27.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, light orangish brown, contains mica, no HCl reaction, homogenous structure	SP-SM	88.2					silt cuttings
		SP-SM			25	S-8, SPT 6+7+9 REC=10", 56%		23.5 ft: smooth drilling, brown drilling fluid
27.0	27.0 - 37.0 ft: CLAYEY SAND, fine to medium grained sand, wet, orangish brown, contains mica, no HCl reaction		83.2					
					30	S-9, SPT 3+3+3 REC=16", 89%		28.5 ft: Softer drilling, orangish brown and brown cuttings, clayey sand cuttings
	32.0 ft: Changes to fine grained sand, orangish brown and brown, no mica	SC						
					35	S-10, SPT 1+1/12" REC=15", 83%		33.5 - 38.5 ft: easy drilling, slightly harder drilling at 37 ft
37.0	37.0 - 47.5 ft: SANDY LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction, very soft, homogenous structure		73.2					
					40	S-11, SPT woh+1+2 REC=17", 94%		38.5 - 43.5 ft: uniform drilling resistance, soft drilling, orangish brown and brown, sandy lean clay cuttings
	43.5 ft: Changes to gray and light gray	CL						
					45	S-12, SPT 1+3+3 REC=18", 100%		43.5 - 48.5 ft: brown and gray drilling fluid, fine sandy clay cuttings

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
47.5	47.5 - 52.5 ft: LEAN CLAY, moist, gray and light gray, estimated <5% fine grained sand, no HCl reaction, firm, homogenous structure	CL	62.7		S-13, SPT 3+4+5 REC=18", 100%		48.5 ft: driller de-sanded 150 gallons of drilling fluid, driller added 75 gallons of clean water with 1/2 bag of bentonite
52.5	52.5 - 60.5 ft: LEAN CLAY, moist, light gray, estimated <5% fine grained sand, contains mica, no HCl reaction, firm to hard, homogenous structure	CL	57.7		S-14, SPT 4+5+7 REC=18", 100%		48.5 ft: smooth drilling, brown drilling fluid
59.0	59.0 ft: Changes to 0.5 inch layer of silty sand, fine sand particles, wet, gray, no HCl reaction	CL			S-15, SPT 5+7+9 REC=18", 100%		53.5 - 58.5 ft: slightly harder drilling, light gray drilling fluid
60.5	60.5 - 65.5 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, contains mica, no HCl reaction, very soft to soft, homogenous structure	CL	49.7		S-16, SPT 5+5+6 REC=12", 67%		58.5 - 61.0 ft: easy drilling, light gray drilling fluid, lean clay cuttings
65.5	65.5 - 68.0 ft: SILTY SAND, fine to medium grained sand, moist, dark gray, contains mica, estimated <5% shell fragments, weak cementation, fine sand size highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	44.7		S-17, SPT 7+9+15 REC=18", 100%		61.0 - 63.5 ft: bit clogged with clay while lowering; driller pulled and cleaned bit; smooth drilling, gray drilling fluid
68.0	68.0 - 70.5 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, rounded to subrounded particles, moist, gray and light gray, contains mica, no HCl reaction, weak cementation from 68.5 to 68.6 ft	SP-SM	42.2		S-18, SPT 38+50/3" REC=9", 100%		63.5 - 66.0 ft: easy drilling, light gray drilling fluid
70.5	70.5 - 78.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated <5% shell fragments, fine sand size, highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil), contains a 0.5 inch layer of sandy silt, moist, gray, est < 5% shells (fine sand size highly weathered shells,	SP-SM	39.7		S-19, SPT 50/3" REC=3", 100%		66.0 - 68.5 ft: slight rig chatter at 68 ft (possible cemented sand)
					S-20, SPT 31+50/6" REC=9", 75%		68.5 - 71.0 ft: hard drilling, uniform drilling resistance
					S-21, SPT		71.0 - 73.5 ft: slightly easier drilling, light gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	weak HCl reaction (with shells), no HCl reaction (with soil), soft at 71.0 ft 73.5 ft: Changes to gray and light gray, homogenous structure, weak HCl reaction (with shells and soil)	SP-SM			75	50/5" REC=5", 100%		73.5 - 76.0 ft: smooth drilling (continued)
78.0	78.0 - 84.5 ft: SILTY SAND, fine to medium grained sand, wet, gray and white, estimated <5% fine gravel, estimated 30 - 45% shells, strong cementation, subrounded fine gravel as cemented sand, fine to medium sand size fresh to moderately weathered white shells, strong HCl reaction (with shells), weak HCl reaction (with soil) 81.0 ft: Changes to weak cementation, fine sand to fine gravel size fresh to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil) 83.5 ft: Changes to weak HCl reaction (with shells and soil)	SM	32.2		80	S-22, SPT 50/4" REC=4", 100% S-23, SPT 16+13+17 REC=13", 72% S-24, SPT 12+14+16 REC=15", 83%		78.5 - 81.0 ft: hard drilling, gray drilling fluid 81.0 - 83.5 ft: harder drilling, (possible shells and cemented sands)
84.5	84.5 - 85.5 ft: SANDY SILT, moist, gray, estimated 5 - 10% fine gravel, estimated <5% shells, fine to medium sand size fresh shells, weak HCl reaction (with shells), no HCl reaction (with soil)	ML	25.7		85	S-25, SPT 5+2+7 REC=18", 100%		83.5 - 85.0 ft: Jar labeled as S-25A 84.5 - 85.0 ft: Jar labeled as S-25B
85.5	85.5 - 88.0 ft: SILTY SAND, fine to medium grained sand, wet, gray and brownish gray, estimated <5% fine gravel, no HCl reaction, subangular fine gravel, fine gravel as cemented sand, moderate to strong cementation	SM	24.7			S-26, SPT 34+50/4" REC=8", 80%		85.5 ft: very hard drilling (possible cemented sands)
88.0	88.0 - 93.0 ft: SILTY SAND, fine to medium grained sand, wet, gray and light gray, estimated 5 - 10% shells, estimated <5% fine gravel, fine to medium sand size, fresh to highly weathered shells, angular fine gravel as cemented sand, weak HCl reaction (with shells), no HCl reaction (with soil), moderate to strong cementation (below 89.0 ft)	SM	22.2		90	S-27, SPT 5+50/6" REC=12", 100% S-28, SPT 12+17+19 REC=18", 100%		87.0 ft: hard drilling, slight rig chatter (possible cemented sand) 88.0 ft: softer drilling 89.0 ft: slight rig chatter (possible cemented sand), light gray drilling fluid
93.0	91.0 ft: Changes to fine sand to fine gravel size fresh to moderately weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil) 93.0 - 100.5 ft: SILTY SAND, fine to medium grained sand, wet, gray and light gray, estimated 5 - 10% shells, fine sand to fine gravel size fresh to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil), shell size decreases with depth	SM	17.2		95	S-29, SPT 7+8+7 REC=18", 100% S-30, SPT 5+9+14 REC=16", 89%		92.5 ft: harder drilling (possible shells) 93.5 - 96.0 ft: uniform drilling resistance, smooth drilling
	96.0 ft: Changes to gray, homogenous structure, fine to medium sand size, moderately to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil) 98.5 ft: Changes to fine sand to fine gravel size fresh to highly weathered shells	SM	9.7		100	S-31, SPT 5+5+7 REC=18", 100%		98.5 - 101.0 ft: gray and light gray drilling fluid
100.5		SM						

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
100.5 - 105.5	100.5 - 105.5 ft: SILTY SAND, fine grained sand, wet, gray, estimated <5% shells, homogenous structure, fine to medium sand size moderate to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil) 103.5 ft: Changes to gray and light gray, estimated <5% shells, fine to medium sand size fresh to highly weathered shells	SM				S-32, SPT 4+5+7 REC=18", 100%		
105.5			4.7		105	S-33, SPT 5+6+8 REC=18", 100%		
105.5 - 108.0	105.5 - 108.0 ft: SILTY SAND, fine grained sand, wet, gray, no HCl reaction, homogenous structure, contain a 0.5 inch layer of sandy silt, moist, light gray at 106.9 ft	SM				S-34, SPT 3+3+4 REC=18", 100%		
108.0			2.2					
108.0 - 110.5	108.0 - 110.5 ft: SILTY SAND, fine grained sand, wet, light gray, estimated <5% shells, homogenous structure, fine to medium sand size moderate to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SM				S-35, SPT 3+4+6 REC=18", 100%		108.5 ft: light gray drilling fluid
110.5			-0.3		110			
110.5 - 113.0	110.5 - 113.0 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated <5% shells, firm, fine to medium sand size moderately to highly weathered shells, weak HCl reaction (with shells and soil), contains 2.4 inch layer of silty sand from 112.3 to 112.5 ft; fine to medium sand, wet, olive gray and light gray, est 5 - 10% shells, fine sand to fine gravel size fresh to moderately weathered shells, weak HCl reaction (with shells and soil)	ML				S-36, SPT 3+5+6 REC=18", 100%		
113.0			-2.8			S-37, SPT 6+19+14 REC=18", 100%		114.0 ft: slight rig chatter (possible shells)
113.0 - 115.5	113.0 - 115.5 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated 5 - 10% shells, soft, fine sand to coarse sand size fresh to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil); contains a 3.5 inch layer of silty sand, from 113.2 to 113.5 ft, fine to coarse sand, subrounded particles, wet, gray and white, est 5 - 10% subangular fine gravel as cemented sand, est 5 - 10% shells, fine to medium sand size fresh to highly weathered shells, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM				S-38, SPT 7+8+8 REC=18", 100%		115.5 ft: heavy rig chatter (possible cemented sand)
115.5			-5.3					116.0 - 118.5 ft: uniform drilling resistance, smooth drilling
118.0			-7.8			S-39, SPT 40+19+27 REC=18", 100%		118.5 - 121.0 ft: slightly harder drilling, gray drilling fluid
118.0 - 120.5	118.0 - 120.5 ft: SILTY SAND, fine to medium grained sand, wet, olive gray, estimated 15 - 25% shells, fine to coarse sand size shells moderate to highly weathered shells weak HCl reaction (with shells and soil)	SM						
120.5			-10.3		120	S-40, SPT 8+12+10 REC=18", 100%		121.0 - 123.5 ft: smooth drilling
120.5 - 125	120.5 - 125 ft: SILTY SAND, fine to medium grained sand, wet, olive gray, estimated 5 - 10% shells, estimated <5% fine gravel, fine to coarse sand size fresh to highly weathered shells, fine subrounded gravel as cemented sand, weak HCl reaction with (shells and soil), strong HCl reaction (with cemented sand), moderate to strong cementation, shells and cemented sand decrease with depth	SM				S-41, SPT 7+7+11 REC=17", 94%		123.5 - 126.0 ft: easy drilling
125					125	S-42, SPT 5+8+12 REC=18", 100%		126.0 - 128.5 ft: smooth drilling

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
128.5	120.5 - 128.5 ft: SILTY SAND, fine to medium grained sand, wet, olive gray, estimated 5 - 10% shells, fine to medium sand size moderately to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil) 123.5 ft: Changes to fine grained sand, estimated <5% shells, fine to medium sand size moderately to highly weathered shells, contains a 0.5 inch layer of silt at 124.3 ft, moist, olive gray, est < 5% fine sand particles, no HCl reaction, soft 126.0 ft: Changes to homogenous structure, fine sand size highly weathered shells 128.0 - 147.0 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated <5% shells, firm to soft, fine to medium sand size moderately to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil) 133.5 ft: Changes to firm, shells decrease with depth	SM	-18.3					
					130	S-43, SPT 7+9+10 REC=18", 100%		
					135	S-44, SPT 5+5+9 REC=18", 100%		133.5 - 138.5 ft: light gray drilling fluid, sandy silt, fine to medium sand sized shell cuttings
					140	S-45, SPT 6+7+8 REC=18", 100%		137.0 ft: harder drilling
					145	S-46, SPT 5+6+9 REC=18", 100%		138.5 - 143.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
147.0	143.5 ft: Changes to olive gray and grayish green, estimated <5% shells, fine to medium sand size moderately to highly weathered shells, weak HCl reaction (with shells and soil)							143.5 - 148.5 ft: silt and fine sand cuttings
	147.0 - 152.0 ft: SILTY SAND, fine grained sand, wet, olive gray, estimated 5 - 10% shells, fine to medium sand size fresh to moderately weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-36.8					
					150	S-47, SPT 6+7+10 REC=18", 100%		148.5 - 153.5 ft: olive gray drilling fluid
152.0	152.0 - 172.5 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated <5% shells, fine to medium sand size moderately to highly weathered shells, weak HCl reaction (with shells and soil)	ML	-41.8					
						S-48, SPT 4+5+8 REC=18", 100%		153.5 - 158.5 ft: easy drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
					155			153.5 - 158.5 ft: easy drilling (continued)
	158.5 ft: Changes to olive gray, fine sand size moderate to highly weathered shells					S-49, SPT 5+6+9 REC=18", 100%		
					160			161.0 ft: harder drilling
	163.5 ft: Changes to fine to medium sand size moderate to highly weathered shells	ML				S-50, SPT 5+6+7 REC=18", 100%		163.5 - 168.5 ft: easy drilling
					165			
	168.5 ft: Changes to fine sand size highly weathered shells					S-51, SPT 4+5+7 REC=18", 100%		168.0 - 173.5 ft: smooth drilling
					170			
172.5	172.5 - 182.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm to hard, homogenous structure	ML	-62.3			S-52, SPT 5+6+7 REC=18", 100%		173.5 - 178.5 ft: soft drilling, olive gray and gray drilling fluid
					175			
						S-53, SPT 5+6+9 REC=18", 100%		178.5 - 183.5 ft: fine sand in cuttings 179.0 ft: harder drilling 180.0 ft: softer drilling
					180			


(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-352**
Schnabel No.: 06120048
Sheet: 8 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
182.0	182.0 - 200.0 ft: SILT WITH SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shells, firm to hard, homogenous structure, fine sand size highly weathered shells, weak HCl reaction (with shells and soil)		-71.8					178.5 - 183.5 ft: fine sand in cuttings (continued)
					185	S-54, SPT 5+6+8 REC=18", 100%		183.5 - 188.5 ft: uniform drilling resistance, smooth drilling, olive gray and gray drilling fluid
					190	S-55, SPT 5+6+9 REC=18", 100%		188.5 - 193.5 ft: olive gray drilling fluid
					195	S-56, SPT 6+9+10 REC=18", 100%		193.5 - 198.5 ft: easy drilling
200.0	193.5 ft: Changes to hard		-89.8		200	S-57, SPT 6+6+10 REC=18", 100%		

Bottom of Boring at 200.0 ft.

NOTE: Negative groundwater depth denotes water level above ground surface (i.e. "negative depth"), but does not necessarily imply artesian conditions.



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-353**
Schnabel No.: 06120048
Sheet: 1 of 8

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: S. Effland

Schnabel Representative: K. Bell

Equipment: CME-75 (Truck); AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone Roller Bit
3-3/4" O.D. Tri-cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/16/08 **Finished:** 7/16/08

Easting: 460972.2 ft **Northing:** 216772.7 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 110.9 (ft) **Total Depth:** 200.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/16	3:00 PM	23.5'	14.0'	---
Start of Day	7/17	7:00 AM	3.5'	14.0'	---
Encountered	7/17	6:00 PM	-1.5'	14.0'	---
Start of Day	7/18	7:00 AM	10.5'	14.0'	---
Completion	7/21	8:20 AM	26.0'	14.0'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.2	0.0 - 0.2 ft: Topsoil		110.7					0.0 - 2.5 ft: Advanced 6 1/4 ID HSA to 14 ft: Uniform drilling, changes as noted below. See end of boring log for additional remarks.
2.0	0.2 - 2.0 ft: CLAYEY SAND, fine to medium grained sand, dry, yellowish brown and brown, contains mica, contains roots, no HCl reaction	SC	108.9			S-1, SPT 1+3+3 REC=13", 217%		
4.5	2.0 - 4.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, orangish brown and brown, contains mica, estimated <5% roots, no HCl reaction	SP-SM	106.4			S-2, SPT 1+2+2 REC=12", 40%		
7.0	4.5 - 7.0 ft: CLAYEY SAND, fine to medium grained sand, moist, orangish brown and brown, estimated <5% roots, no HCl reaction, sand size decrease with depth	SC	103.9		5	S-3, SPT 4+4+2 REC=15", 83%		5.0 - 7.5 ft: orangish brown cuttings
	7.0 - 17.0 ft: POORLY GRADED SAND, fine to medium grained sand, dry, orangish brown and yellowish brown, no HCl reaction, homogenous structure, estimated <5% clay	SP-SM			10	S-4, SPT 4+6+6 REC=16", 89%		7.5 - 10.0 ft: orangish brown and brown cuttings
					15	S-5, SPT 4+7+7 REC=17", 94%		10.0 - 13.5 ft: slightly harder drilling
	13.5 ft: Changes to yellowish brown and brown, estimated <5% silt, no clay, contains a 1.0 inch layer of poorly graded sand with silt, dry, dark brown at 14.5 ft					S-6, SPT 3+6+5 REC=18", 100%		13.5 - 14.0 ft: Advance 6 1/4 ID HSA: Uniform drilling resistance, smooth drilling
17.0	17.0 - 22.0 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, subrounded to subangular particles, moist, orangish brown and brown, contains mica, no HCl reaction, wet 0.5 inch at 18.9 ft, contains a 2.0 inch layer of clayey sand, fine to coarse sand, subangular	SP-SM	93.9			S-7, SPT 10+17+18 REC=15", 83%		14.0 ft: Switched to 3 1/2 OD Tricone roller bit (mud rotary), and advanced to 88.5 ft, 2 bags of bentonite mixed with 150 gallons of water, light brown drilling fluid

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	to subrounded coarse sand at 18.5 ft						
22.0	22.0 - 31.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, orangish brown and gray, contains mica, no HCl reaction, sand size decreases with depth	SP-SM	88.9				21.0 - 21.5 ft: orangish brown drilling fluid
					25	S-8, SPT 4+6+5 REC=11", 61%	23.5 - 28.5 ft: slightly harder drilling, uniform drilling resistance
	27.0 ft: Changes to contains 2.0' layer of saturated soil at 30 ft, with speckles of black from 28.5 to 30 ft	SP-SM					
					30	S-9, SPT 5+7+4 REC=16", 89%	28.5 - 33.5 ft: from 31 to 31.5 ft, softer drilling
31.0	31.0 - 37.0 ft: SILTY SAND, fine to coarse grained sand, rounded to subrounded particles, wet, orangish brown (from 33.5 to 34 ft) reddish brown and gray (from 34 to 34.5 ft) gray (from 34.5 to 35 ft) sand size increases at color change depths, fine to medium sand at 34.5 ft, fine to coarse sand at 34.5 ft. contains a 0.5 inch layer of sandy lean clay, moist, gray at 33.7 ft.	SM	79.9				
					35	S-10, SPT 2+2+2 REC=18", 100%	
37.0	37.0 - 47.0 ft: SANDY LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction, soft, homogenous structure, contains a 1 inch layer of silty sand, fine sand, moist gray at 44.5 ft	CL	73.9				
					40	S-11, SPT 2+2+3 REC=19", 106%	
					45	S-12, SPT 2+3+4 REC=18", 100%	42.0 ft: harder drilling, drilling fluid changed to gray at 43.5 ft 43.5 - 48.5 ft: Uniform drilling resistance, easy drilling, gray drilling fluid

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
47.0	47.0 - 52.0 ft: LEAN CLAY, moist, gray, estimated <5% fine grained sand, no HCl reaction, firm to hard, homogenous structure	CL	63.9					
					50	S-13, SPT 2+4+5 REC=17", 94%		
52.0	52.0 - 57.0 ft: SANDY LEAN CLAY, fine grained sand, moist, gray, contains mica, no HCl reaction, homogenous structure	CL	58.9					53.5 - 58.5 ft: smooth drilling
					55	S-14, SPT 3+4+4 REC=17", 94%		
57.0	57.0 - 61.0 ft: LEAN CLAY, moist, gray, estimated <5% fine grained sand, no HCl reaction, hard, homogenous structure, contains 0.5 inch layer of sandy lean clay at 59.5 ft	CL	53.9					58.5 - 63.5 ft: slightly harder drilling at 61.0 ft, performed marsh funnel test performed 60 sec drilling fluid
					60	S-15, SPT 4+6+7 REC=18", 100%		
61.0	61.0 - 67.0 ft: SANDY LEAN CLAY, fine grained sand, moist, gray and light gray, contains mica, no HCl reaction, firm, homogenous structure	CL	49.9					
	63.5 ft: Changes to soft to very soft							
					65	S-16, SPT 4+5+6 REC=18", 100%		
	66.0 ft: Changes to hard to very hard							63.5 - 66.0 ft: Uniform drilling resistance, smooth drilling. Driller de-sanded mud tub, driller added 50 gallons of clean water to drilling fluid, driller flushed hole with new drilling fluid.
67.0	67.0 - 70.5 ft: SILTY SAND, fine to medium grained sand, moist, dark gray, contains mica, no HCl reaction, homogenous structure, moderate to strong cementation	SM	43.9					66.0 - 68.5 ft: hard drilling at 67.5, light gray drilling fluid, 66-67.0 ft: jar labeled as S-18A, 67-67.5: jar labeled as S-18B
	68.5 ft: Changes to gray and light gray, estimated <5% shell fragments, fine sand size highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil), weak cementation							68.5 - 71.0 ft: hard drilling
70.5	70.5 - 83.0 ft: POORLY GRADED SAND, fine grained sand, moist, light gray, estimated <5% silt, contains mica, no HCl reaction	SP	40.4					
					70	S-17, SPT 4+4+7 REC=15", 83%		
						S-18, SPT 8+11+15 REC=17", 94%		
						S-19, SPT 21+17+21 REC=17", 94%		
						S-20, SPT 50/4" REC=4", 83%		
						S-21, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
					75	50/6" REC=4", 67%		73.5 - 76.0 ft: fine sands gray in color, est < 5% fine shells (moderately weathered) (continued)
	76.0 ft: Changes to wet, estimated <5% shell fragments, fine to medium sand size, moderately to highly weathered, weak HCl reaction (both soil and shells)					S-22, SPT 50/3" REC=3", 83%		
	78.5 ft: Changes to fine to medium, fresh to highly weathered shell fragments, weak HCl reaction (with shells), no HCl (with soil)	SP			80	S-23, SPT 50/4" REC=4", 83%		78.5 - 81.0 ft: Driller De-sanded mud tub
	81.0 ft: Changes to fine to medium sand size highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soils), weak to moderate cementation					S-24, SPT 50/5" REC=4", 67%		
83.0	83.0 - 90.0 ft: SILTY SAND, fine to medium grained sand, wet, gray and light gray, estimated 30 - 45% shell fragments, fine sand to fine gravel size fresh to highly weathered shells, weak HCl reaction (shells and soil), moderate to strong cementation, fine gravel size cementation		27.9		85	S-25, SPT 23+18+14 REC=15", 83%		83.0 ft: rig chatter (possible cemented sand)
	85.5 ft: Changes to estimated 15 - 25% shell fragments, fine to coarse sand size shells, strong HCl reaction (with shells), weak HCl reaction (with soil at cemented sands), strong cementation	SM				S-26, SPT 3+50/3" REC=6", 63%		83.5 - 86.0 ft: hard drilling, slight rig chatter at 85.5 ft (possible cemented sand), light gray drilling fluid
	88.5 ft: Changes to gray and olive gray, estimated 5 - 10% shell fragments, no HCl reaction, fine to medium sand size shells, weak HCl reaction (with shells and soils)					S-27, SPT 50/4" REC=4", 83%		86.0 - 88.5 ft: heavy rig chatter from 86.5 to 87.3 ft, softer drilling from 87.3 to 87.8 ft, rig chatter from 87.8 to 88.5 ft, marsh funnel test performed 45 sec drilling fluid
90.0	90.0 - 93.0 ft: SILTY SAND, fine grained sand, wet, greenish gray and gray, estimated 5 - 10% shell fragments, fine to medium sand size, moderately to highly weathered shells, weak HCl reaction, (with soil and shells), moderate cementation fine to coarse sand size	SM	20.9		90	S-28, SPT 67/6" REC=5", 83%		88.5 ft: Driller switched to 3" OD Tricone roller bit, softer drilling at 90 ft, drilling fluid light gray, Driller switched to a 3 3/4 OD Tricone roller bit and advanced to 200.0 ft.
93.0	93.0 - 110.5 ft: SILTY SAND, fine grained sand, wet, olive gray, estimated <5% shell fragments, fine to coarse sand size fresh to highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil)		17.9		95	S-29, SPT 9+11+11 REC=17", 94%		91.0 - 93.5 ft: slight rig chatter at 93 ft (possible cemented sand)
	96.0 ft: Changes to gray, estimated 5 - 10% shell fragments, fine sand to fine gravel size fresh to highly weathered shells, no HCl reaction with soil, weak HCl reaction with shells	SM				S-30, SPT 5+8+10 REC=18", 100%		93.5 - 96.0 ft: Uniform resistance, easy drilling, drilling marsh funnel test performed, 43 sec drilling fluid
	98.5 ft: Changes to gray and light gray, fine sand to fine gravel size shells, weak HCl Reaction (with soil and shells)				100	S-31, SPT 8+10+10 REC=18", 100%		96.0 - 98.5 ft: easy drilling, gray drilling fluid

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	101.0 ft: Changes to gray, estimated <5% shell fragments					S-32, SPT 7+9+14 REC=16", 89%		98.5 - 101.0 ft: harder drilling, driller used 100 gallons of drilling fluid, added 1/2 bag of bentonite to drilling (continued)
	103.5 ft: Changes to gray and olive gray, fine to coarse sand size highly to moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)				105	S-33, SPT 5+8+11 REC=17", 94%		101.0 - 103.5 ft: easy drilling
	105.5 ft: Changes to fine to medium sand size shell fragments, highly weathered, no HCl reaction (with shells), no HCl reaction (with soil)	SM				S-34, SPT 5+5+7 REC=17", 94%		103.5 - 106.0 ft: smooth drilling
	108.0 ft: Changes to contains mica, no HCl reaction					S-35, SPT 3+15+5 REC=17", 94%		106.0 - 108.5 ft: gray and olive gray drilling fluid
110.5	110.5 - 113.0 ft: SILTY SAND, fine grained sand, gray, estimated <5% shell fragments, fine sand size, highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	0.4		110	S-36, SPT 3+3+5 REC=18", 100%		108.5 - 110.0 ft: gray drilling fluid, marsh funnel test performed (45 sec drilling fluid)
113.0	113.0 - 118.0 ft: SILTY SAND, fine grained sand, wet, gray and white, estimated 15 - 25% shell fragments, fine sand to fine gravel size, fresh to highly weathered shells, weak HCl reaction (with shell and soil), shells increase with depth and have strong cementation around them. White shells	SM	-2.1		115	S-37, SPT 8+10+26 REC=14", 78%		115.0 ft: rig chatter (possible cemented shells), hard drilling
						S-38, SPT 14+15+17 REC=17", 94%		116.5 ft: rig chatter (possible cemented sand), hard drilling
118.0	118.0 - 123.0 ft: SILTY SAND, fine grained sand, wet, light gray, estimated 5 - 10% shell fragments, fine sand to coarse sand size, fresh to highly weathered shells, strong HCl reaction (with shells), weak HCl reaction (with soil), strong cementation around shells at 119.5 ft.	SM	-7.1		120	S-39, SPT 7+17+39 REC=17", 94%		118.5 - 121.0 ft: Rig chatter throughout (possible cemented sands)
	120.5 ft: Changes to fine sand to fine gravel size shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil), shells increase with depth.					S-40, SPT 10+11+17 REC=18", 100%		121.0 - 123.5 ft: smooth drilling, light gray drilling fluid
123.0	123.0 - 137.0 ft: SILTY SAND, fine grained sand, wet, gray and olive gray, estimated <5% shell fragments, fine sand size highly weathered shells, contains a 1.5 inch layer of sandy slit, wet, olive gray at 124.5 ft, weak HCl reaction (with shells and soil), shells decrease with depth.	SM	-12.1		125	S-41, SPT 12+13+13 REC=17", 94%		123.5 - 126.0 ft: gray drilling fluid
	126.0 ft: Changes to fine to coarse sand size fresh to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil), contains a 1.0 inch layer of					S-42, SPT 6+6+12 REC=18", 100%		126.0 - 128.5 ft: gray and and dark gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	sandy silt, moist, olive gray at 126.2 ft							
	128.5 ft: Changes to fine sand to fine gravel size fresh to highly weathered shell fragments, weak HCl reaction (with shells and soil), shells increase with depth				130	S-43, SPT 4+9+15 REC=18", 100%		128.5 - 133.5 ft: Driller de-sanded 100 gallons of drilling fluid with 50 gallons of clean water to drilling fluid; driller flushed the hole with the new drilling fluid.
	133.5 ft: Changes to fine sand size highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SM			135	S-44, SPT 4+9+10 REC=18", 100%		133.5 - 138.5 ft: easy drilling light gray drilling fluid
137.0	137.0 - 173.5 ft: SANDY SILT, fine grained sand, moist, olive gray and grayish green, estimated <5% shells, fine sand size, highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil), hard to very hard, homogenous		-26.1		140	S-45, SPT 6+9+11 REC=18", 100%		138.5 - 143.5 ft: slightly faster drilling at 142 ft
	143.0 ft: Changes to fine to medium sand size fresh to highly weathered shell fragments, firm to hard, wet from 143.6 to 143.7 ft				145	S-46, SPT 4+7+8 REC=18", 100%		
	148.5 ft: Changes to fine sand to fine gravel size angular & fresh to highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	ML			150	S-47, SPT 4+5+6 REC=18", 100%		146.5 ft: harder drilling (possible sand) gray and greenish gray drilling fluid
	153.5 ft: Changes to fine to medium sand size moderately to highly weathered shell fragments, weak HCl					S-48, SPT 5+7+9 REC=18", 100%		148.5 - 153.5 ft: Uniform drilling resistance, easy drilling, gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	reaction (with shells and soil), soft to firm				155			153.5 - 158.5 ft: smooth drilling, olive gray drilling fluid (<i>continued</i>)
	158.5 ft: Changes to fine to medium sand size, highly weathered shell fragments, weak HCl reaction (with shells and soil), firm to hard				160	S-49, SPT 4+6+7 REC=18", 100%		158.5 - 163.5 ft: driller added ~ 1/2 bag of bentonite to ~30 gallons of clean water at 158.5 ft, marsh funnel test performed (48 drilling fluid), slower drilling, gray drilling fluid
	163.5 ft: Changes to fine sand size shells	ML			165	S-50, SPT 6+7+9 REC=18", 100%		163.5 - 168.5 ft: greenish gray and olive gray drilling fluid
	168.5 ft: Changes to fine sand size, highly weathered				170	S-51, SPT 5+5+7 REC=18", 100%		168.5 - 173.5 ft: steadily harder drilling from 172.0 ft + drilling fluid, gray and olive drilling fluid
173.5	173.5 - 197.0 ft: SANDY SILT, fine grained sand, moist, olive gray, estimated <5% shells, fine sand size, highly weathered, weak HCl reaction (with shells and soil), firm to hard	ML	-62.6		175	S-52, SPT 5+6+7 REC=18", 100%		173.5 - 178.5 ft: Driller desanded 150 gallons of drilling fluid, and added 25 gallons of clean water, marsh funnel test performed (50 sec drilling fluid), light gray drilling fluid
					180	S-53, SPT 6+7+8 REC=18", 100%		178.5 - 183.5 ft: slightly hard drilling at 179 ft

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	183.5 ft: Changes to homogenous structure						178.5 - 183.5 ft: slightly hard drilling at 179 ft (continued) 183.5 - 188.5 ft: easy drilling
					185	S-54, SPT 5+7+9 REC=16", 89%	
					190	S-55, SPT 6+6+8 REC=16", 89%	188.5 - 193.5 ft: driller pumped 75 gallons of drilling fluid and filled the mud tub back up with clean water
					195	S-56, SPT 5+7+10 REC=18", 100%	193.5 - 198.5 ft: Advanced 3 3/4 OD Tricone Roller Bit; Progressively harder drilling with depth
197.0	197.0 - 200.0 ft: SANDY SILT, fine grained sand, moist, olive gray and grayish brown, estimated <5% shell fragments, (fine small size, highly weathered), weak HCl reaction (with soils and shells), hard, homogenous	ML	-86.1			S-57, SPT 6+8+9 REC=17", 94%	
200.0			-89.1		200		

Bottom of Boring at 200.0 ft.

Please refer to original field log for End of Day groundwater observation depths.



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-354**
Schnabel No.: 06120048
Sheet: 1 of 10

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: W. Wolfe

Schnabel Representative: D. Cepull

Equipment: CME-550; AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger
3-1/4" O.D. Tri-cone Roller Bit,
6" O.D. Tri-cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 6/23/08 **Finished:** 7/3/08

Easting: 961099.6 ft **Northing:** 217130.4 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 91± (ft) **Total Depth:** 251.5 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	6/23	4:29 PM	19.7'	18.5'	---
Start of Day	6/25	6:58 AM	27.0'	18.5'	---
Start of Day	6/27	7:30 AM	9.0'	18.5'	---
Start of Day	7/1	7:16 AM	29.0'	18.5'	---
Completion	7/2	5:11 PM	22.0'	18.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.3	0.0 - 0.3 ft: Topsoil		90.9			S-1, SPT 2+2+4 REC=13", 72%		0.0 ft: advanced 6 1/4" ID HSA to 18.5 ft; 0 to 1.5 ft interval uniform drilling resistance; changes as noted below, see end of boring log for additional remarks
2.9	0.3 - 2.9 ft: SILTY SAND, fine grained sand, moist, orangish brown, estimated <5% organics, organic odor, no HCl reaction	SM						2.5 - 2.9 ft: jar labeled as S-2A
2.9	2.5 ft: Changes to no organics, no odor		88.3			S-2, SPT 3+4+3 REC=14", 78%		2.9 - 4.0 ft: jar labeled as S-2B
4.5	2.9 - 4.5 ft: WELL GRADED SAND, fine to coarse grained sand, subrounded particles, moist, orangish brown, no HCl reaction, contains 0.5 inch layer of (iron) cemented coarse sand and fine gravel at 3.7 ft. (fine gravel fracture)	SW	86.7		5	S-3, SPT 4+4+5 REC=16", 89%		5.0 - 7.5 ft: smooth drilling, orangish brown cuttings
4.5	4.5 - 7.0 ft: WELL GRADED SAND WITH SILT, fine to coarse grained sand, subrounded particles, moist, orangish brown, no HCl reaction	SW-SM						
7.0	7.0 - 9.5 ft: SILTY SAND, fine to coarse grained sand, subrounded particles, moist, orangish brown, estimated <5% fine gravel, no HCl reaction	SM	84.2			S-4, SPT 3+4+4 REC=18", 100%		
9.5	9.5 - 12.0 ft: POORLY GRADED SAND, fine to coarse grained sand, subrounded particles, moist, light orangish brown, estimated 5 - 10% fine gravel, no HCl reaction, (subrounded fine gravel)	SP	81.7		10	S-5, SPT 3+5+8 REC=14", 78%		
12.0	12.0 - 14.5 ft: CLAYEY SAND WITH GRAVEL, fine to coarse grained sand, subrounded particles, moist, orangish brown, no HCl reaction	SC	79.2			S-6, SPT 4+8+9 REC=16", 89%		
14.5	14.5 - 17.5 ft: SILTY SAND WITH GRAVEL, fine to coarse grained sand, subrounded particles, moist, orangish brown, (fine gravel); 0.25 inch layer of white clay at 15.8 ft)	SM	76.7		15	S-7, SPT 4+9+11 REC=17", 94%		15.0 - 16.5 ft: hammer energy test performed
17.5	17.5 - 22.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, subangular particles, moist, light orangish brown, estimated <5% fine gravel, no HCl reaction, (subrounded gravel), contains 0.25 inch layer of	SP-SM	73.7			S-8, SPT 1+2+3 REC=14", 78%		18.5 ft: switched to 3 1/4" OD tricone roller bit (mud rotary) and

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	white clay at 19.6 and 19.8 ft	SP-SM					advanced to 196.5 ft; 18.5 to 23.5 ft interval, brown drilling fluid
22.0	22.0 - 24.2 ft: POORLY GRADED SAND WITH GRAVEL, fine to medium grained sand, subangular particles, wet, orangish brown, (subrounded fine gravel)	SP	69.2				
24.2	24.2 - 24.6 ft: FAT CLAY WITH SAND, fine grained sand, moist, light brown, estimated 5 - 10% fine and coarse sand, very hard	CH	67.0				23.5 - 24.2 ft: jar labeled as S-9A
24.6	24.6 - 28.0 ft: SANDY SAND, fine to medium grained sand, moist, dark orangish brown	SM	66.6		25	S-9, SPT 23+13+4 REC=17", 94%	23.7 - 24.2 ft: roller bit grinding, gray drilling fluid
28.0	28.0 - 42.0 ft: LEAN CLAY, moist, grayish brown, estimated <5% sand, contains mica, no HCl reaction, soft	CL	63.2		30	S-10, SPT 3+3+5 REC=18", 100%	24.2 - 24.6 ft: jar labeled as S-9B
					35	S-11, SPT 3+5+5 REC=18", 100%	28.5 - 33.5 ft: hammer energy test performed; little drilling resistance
					40	S-12, SPT 3+4+7 REC=18", 100%	33.5 - 35.0 ft: hammer energy test performed
					45	S-13, SPT 5+7+9 REC=18", 100%	35.0 ft: clay reducer added
42.0	42.0 - 44.5 ft: SANDY LEAN CLAY, moist, grayish brown, hard, clayey sand layer between 42.8 and 43 ft	CL	49.2			S-14, SPT 10+8+11 REC=18", -60%	36.0 ft: increased drilling resistance
44.5	44.5 - 47.0 ft: SANDY LEAN CLAY, moist, grayish brown, no HCl reaction, soft	CL	46.7			S-15, SPT 6+7+8 REC=12", 67%	37.5 ft: drilling resistance decreased
							38.5 - 40.0 ft: uniform drilling resistance
							45.0 - 46.5 ft: hammer energy test performed

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
47.0	47.0 - 50.8 ft: CLAYEY SAND, moist, grayish brown, contains mica, no HCl reaction	SC	44.2			S-16, SPT 5+5+6 REC=17", 94%		
50.8	50.8 - 52.0 ft: SILTY SAND, fine grained sand, moist, orangish brown, no HCl reaction, contains 0.5 inch layer of cemented sands at 50.6 ft, contains 1 inch layer of clayey sand at 51.4 ft, moist, fine sand, grayish brown with mica	SM	40.4		50	S-17, SPT 8+9+21 REC=16", 89%		50.0 - 50.8 ft: jar labeled as S-17A
52.0	52.0 - 54.5 ft: SILTY SAND, fine to coarse grained sand, moist, orangish brown, contains mica, no HCl reaction	SM	39.2			S-18, SPT 14+50/3" REC=9", 50%		50.8 - 51.5 ft: jar labeled as S-17B
54.5	53.6 ft: Changes to strong HCl reaction (with shells) at thin white seashell layer	SP	36.7		55	S-19, SPT 50/3" REC=1", 6%		51.0 ft: harder material encountered
57.0	54.5 - 57.0 ft: POORLY GRADED SAND, fine to medium grained sand, moist, light brown, no HCl reaction	SM	34.2			S-20, SPT 50/5" REC=5", 104%		52.5 - 55.0 ft: rig chatter at 53 ft, hard drilling throughout interval
59.5	57.0 - 59.5 ft: SILTY SAND, fine grained sand, moist, light brown, contains mica	SM	31.7		60	S-21, SPT 50/5" REC=5", 104%		55.0 - 57.5 ft: hard resistance drilling
64.5	59.5 - 64.5 ft: CLAYEY SAND, fine grained sand, wet, orangish brown, contains mica	SC	26.7			S-22, SPT 3+11+25 REC=12", 67%		61.0 ft: decreased drilling resistance
67.0	62.5 ft: Changes to contains shells, strong HCl reaction (with shells)	SM	24.2		65	S-23, SPT 50/6" REC=6", 33%		62.5 - 65.0 ft: moderately hard drilling resistance
68.3	64.5 - 67.0 ft: SILTY SAND, fine grained sand, wet, grayish brown, contains mica, contains shell fragments, weak HCl reaction (with shells)	SC	22.9			S-24, SPT 3+4+20 REC=18", 100%		65.0 - 67.5 ft: hard drilling resistance
	67.0 - 68.3 ft: CLAYEY SAND, fine grained sand, moist, light brownish gray, estimated 5 - 10% shells, weak HCl reaction	SM			70	S-25, SPT 4+11+9 REC=18", 100%		67.5 - 68.3 ft: jar labeled as S-24A
	68.3 - 74.5 ft: SILTY SAND, fine grained sand, moist, brownish gray, weak HCl reaction					S-26, SPT 40+7+9 REC=18", 100%		68.3 - 69.0 ft: jar labeled as S-24B
	73.3 ft: Changes to estimated 5 - 10%							69.3 ft: extremely hard with considerable drilling resistance
								69.8 ft: broke through hard material
								72.0 ft: hard drilling resistance

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
74.5	shells	SM	16.7					
	74.5 - 92.0 ft: SILTY SAND, fine grained sand, wet, brownish gray, estimated 15 - 25% shell fragments, weak HCl reaction				75	S-27, SPT 50/5"		75.1 - 77.5 ft: extremely hard drilling resistance 75.4 ft: hammer energy test performed
	77.0 ft: Changes to estimated 5 - 10% shell fragments					S-28, SPT 5+5+7 REC=18", 100%		
	80.0 ft: Changes to estimated 15 - 25% shell fragments				80	S-29, SPT 5+4+7 REC=18", 100%		80.0 - 82.5 ft: uniform drilling, minor resistance
	82.5 ft: Changes to estimated 5 - 10% shell fragments	SM				S-30, SPT 6+5+6 REC=18", 100%		
	85.0 ft: Changes to no HCl reaction				85	S-31, SPT 5+4+7 REC=18", 100%		
	87.5 ft: Changes to estimated <5% shell fragments					S-32, SPT 4+4+7 REC=18", 100%		87.5 - 90.0 ft: uniform drilling resistance
	90.0 ft: Changes to moist, no shell fragments				90	S-33, SPT 6+4+6 REC=18", 100%		90.0 - 91.5 ft: slight to moderate drilling resistance, performed hammer energy test
92.0	92.0 - 97.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, brownish gray, no HCl reaction	SP-SM	-0.8			S-34, SPT 3+3+4 REC=18", 100%		90.0 ft: lost 350 gallons of drilling fluid in boring; after re-introduction of water and drilling fluid by drillers slow drilling fluid
					95	S-35, SPT 3+4+4 REC=10", 56%		92.5 - 95.0 ft: uniform drilling resistance, brownish gray drilling fluid
97.0	97.0 - 99.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, brownish gray, estimated 5 - 10% shells, (white shells), strong HCl reaction (with shells)	SP-SM	-5.8			S-36, SPT 15+20+20 REC=18", 100%		
99.5	99.5 - 109.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated 15 - 25% shell	SP-SM	-8.3		100	S-37, SPT 27+16+17		99.5 - 100.0 ft: some drilling resistance, light

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	fragments, weak HCl reaction (with shells)				REC=18", 100%		rod chatter
	102.5 ft: Changes to gray and white, estimated 5 - 10% shell fragments, (white shell fragments), weak HCl reaction (with shells)				S-38, SPT 5+22+31 REC=18", 100%		102.0 - 105.0 ft: uniform drilling resistance, light gray drilling fluid
	105.0 ft: Changes to estimated <5% shell fragments, (white shell fragments), weak HCl reaction (with shells)	SP-SM			S-39, SPT 12+23+22 REC=18", 100%		105.0 - 106.5 ft: hammer energy test performed
					S-40, SPT 9+14+18 REC=18", 100%		
109.5	109.5 - 127.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, contains shell fragments, (white shell fragments), weak HCl reaction with shells		-18.3		S-41, SPT 6+6+10 REC=18", 100%		110.0 - 113.5 ft: light to medium gray drilling fluid
					S-42, SPT 10+8+13 REC=18", 100%		
					S-43, SPT 5+6+11 REC=18", 100%		118.5 - 120.0 ft: hammer energy test performed
	118.5 ft: Changes to no HCl reaction	SP-SM			S-44, SPT 5+6+8 REC=18", 100%		
					S-45, SPT 5+6+10 REC=18", 33%		
	123.5 ft: Changes to no shell fragments						
127.0	127.0 - 142.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand,	SP-SM	-35.8				

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	moist, gray, contains shell fragments, weak HCl reaction (with shells), contains 0.25 inch layer of white shell fragments between 129.7 and 129.8				130			
	133.5 ft: Changes to estimated 5 - 10% shell fragments, (white shell fragments)				135	S-46, SPT 13+10+10 REC=18", 100%		133.5 - 135.0 ft: hammer energy test performed
	138.5 ft: Changes to contains shell fragments, moderate HCl reaction (with shells)				140	S-47, SPT 8+9+12 REC=18", 100%		138.5 - 140.0 ft: hammer energy test performed
142.5	142.5 - 152.5 ft: SANDY LEAN CLAY, fine grained sand, moist, grayish brown, weak HCl reaction, firm		-51.3		145	S-48, SPT 8+7+12 REC=18", 100%		143.5 - 145.0 ft: hammer energy test performed
	148.5 ft: Changes to estimated <5% shell fragments, hard, (white shell fragments), weak HCl reaction (with shells)				150	S-49, SPT 7+8+11 REC=18", 100%		148.5 - 150.0 ft: hammer energy test performed
152.5	152.5 - 167.0 ft: SANDY LEAN CLAY, fine grained sand, moist, grayish brown, no HCl reaction, hard		-61.3			S-50, SPT 4+5+7 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
154.8 ft: Changes to wet					155		153.5 - 158.0 ft: uniform drilling resistance, light gray drilling fluid (continued)
158.5 ft: Changes to moist, weak HCl reaction, firm					160	S-51, SPT 4+5+7 REC=18", 100%	
		CL			165	S-52, SPT 5+7+9 REC=17", 94%	163.5 - 165.0 ft: hammer energy test performed
167.0	167.0 - 182.0 ft: LEAN CLAY, moist, brownish gray, no HCl reaction, hard		-75.8		170	S-53, SPT 5+7+8 REC=18", 100%	168.0 - 173.5 ft: uniform drilling resistance, light gray fluid, missed photograph for sample S-53
173.5 ft: Changes to weak HCl reaction		CL			175	S-54, SPT 4+6+8 REC=18", 100%	
					180	S-55, SPT 8+9+12 REC=18", 100%	178.5 - 180.0 ft: hammer energy test performed

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
182.0	182.0 - 196.5 ft: LEAN CLAY, moist, brownish gray, no HCl reaction, firm	CL	-90.8					
					185	S-56, SPT 7+9+10 REC=18", 100%		
	188.5 ft: Changes to homogenous structure				190	S-57, SPT 6+8+11 REC=18", 100%		
		SM			195	S-58, SPT 6+7+10 REC=18", 100%		193.5 - 196.5 ft: performed hammer energy test
196.5	196.5 - 199.3 ft: SILTY SAND, fine grained sand, moist, brownish gray, weak HCl reaction		-105.3			UD-1, UNDIST REC=10", 104% UD-2, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	196.5 ft: attempted to lower shelly tube for sampling; could not lower shelly tube past 110 ft; switched to 6"OD tricone roller bit and advanced to 195.5 ft, reamed hole to 196.5 ft: shelly tube attempt at 196.5 ft, soil too hard, pushed 10"; 10"
199.3	199.3 - 203.0 ft: SILTY SAND, fine grained sand, moist, brownish gray, estimated 5 - 10% shell fragments, contains bands of highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)		-108.1		200	S-59, SPT 5+7+18 REC=8", 44%		recovery, drillers unable to shear soil for shelly tube, sample placed in jar and labeled UD-1
203.0	203.0 - 208.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, brownish gray, estimated <5% shell fragments, (highly weathered shell fragments), contains 0.3 inch inclusion of SANDY SILT (SM), moist, orangish brown at 203.5 ft, 1 inch layer of SILTY SAND (SM) between 204.4 and 204.5 ft, brownish gray	SP-SM	-111.8		205	S-60, SPT 7+17+24 REC=18", 100%		197.3 - 199.3 ft: advanced pitcher tube sampler, pushed 24"
208.5	208.0 - 212.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand,		-117.3			UD-3, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 3.50 tsf PP = 4.50 tsf	199.3 ft: switched to 3 1/4" OD tricone roller bit, uniform drilling resistance 203.5 - 206.5 ft:

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	brownish gray, contains mica, no HCl reaction, contains 2.5 inch layer of SILTY SAND (SM) at 20.8 ft, most, medium sand, brownish gray, contains mica, no HCl reaction	SP-SM			210	S-61, SPT 7+12+24 REC=18", 100%		switched to 6" OD tricone roller bit, reamed hole from 199.5 ft to 203.5 ft
212.5	212.5 - 228.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, brownish gray, no HCl reaction	SP-SM	-121.3		215	S-62, SPT 5+8+13 REC=18", 100%		206.5 - 208.5 ft: pushed pitcher tube 24", 24" recovery
						UD-4, UNDIST REC=24", 100%	PP = 3.50 tsf PP = 2.50 tsf PP = 3.00 tsf	208.5 - 213.5 ft: switched to 3 1/4" tricone roller bit and advanced to 213.5 ft (continued)
					220	S-63, SPT 6+13+23 REC=16", 89%		213.5 - 215.0 ft: hammer energy test performed
					225	S-64, SPT 5+6+10 REC=16", 89%		215.5 - 216.5 ft: switched to 6" tricone roller bit and reamed hole from 208.5 to 216.5 ft
						UD-5, SPT REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	216.5 ft: pushed pitcher sampler 24", waited 30 minutes, 24" recovery
228.5	228.5 - 238.5 ft: SILTY SAND, fine grained sand, moist, brownish gray, contains highly weathered shell layer at 229.6 ft, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-137.3		230	S-65, SPT 6+9+13 REC=18", 100%		218.5 - 223.5 ft: switched to 3 1/4" tricone roller bit and advanced to 223.5 ft; lost approximately 50 gals of drilling fluid in hole, uniform drilling resistance, gray drilling fluid, contains fine gravel size cuttings
	233.5 ft: Changes to no shells, no HCl reaction				235	S-66, SPT 7+11+13 REC=18", 100%		223.5 - 225.0 ft: hammer energy test performed
								225.5 - 226.5 ft: switched to 6" OD tricone roller bit, reamed hole from 218.5 to 226.5 ft; lost approx 20 gals of drilling fluid
								226.5 - 228.5 ft: pushed pitcher sampler 24", 24" recovery
								228.5 - 233.5 ft: switched to 3 1/4" tricone roller bit and advanced to 233.5 ft, uniform drilling resistance; gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
238.5	238.5 - 248.5 ft: SILTY SAND, fine grained sand, moist, brownish gray, contains mica, no HCl reaction	SM	-147.3		UD-6, SPT REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	233.5 - 236.5 ft: switched to 6" OD tricone roller bit; hole reamed from 228.5 to 236.5; uniform drilling resistance (continued)
					S-67, SPT 6+9+15 REC=18", 100%		236.5 - 238.5 ft: pushed pitcher sampler 24"; difficult to push pitcher sampler; almost 600 lbs of pressure used to push sampler; tube fully intact, but exterior scratched from advancement with pitcher sampler
					S-68, SPT 6+9+13 REC=18", 88%		238.5 - 240.0 ft: hammer energy test performed
					UD-7, UNDIST REC=19", 79%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	238.5 - 243.5 ft: switched to 3 1/4" OD tricone roller bit and advanced to 243.5 ft
248.5	248.5 - 251.5 ft: POORLY GRADED SAND WITH CLAY, fine grained sand, moist, brownish gray, no HCl reaction	SP-SC	-157.3		S-69, SPT 6+11+15 REC=14", 78%		246.5 - 248.5 ft: pushed pitcher sampler 24", 19" recovery
251.5			-160.3				250.0 - 251.5 ft: hammer energy test performed

Bottom of Boring at 251.5 ft.



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-355**
Schnabel No.: 06120048
Sheet: 1 of 10

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: W. Wolfe

Schnabel Representative: D. Cepull

Equipment: CME-550 (Truck); AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger
3-1/4" O.D. Tri-cone Roller Bit,
6" O.D. Tri-cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/7/08 **Finished:** 7/15/08

Easting: 961175 ft **Northing:** 216925 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 88.2 (ft) **Total Depth:** 250.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/7	9:00 AM	13.5'	18.5'	---
Start of Day	7/9	6:55 AM	15.0'	18.5'	---
Start of Day	7/10	7:00 AM	15.0'	18.5'	---
Start of Day	7/11	7:15 AM	25.0'	18.5'	---
Start of Day	7/14	10:00 AM	30.0'	18.5'	---
Start of Day	7/15	7:00 AM	17.0'	18.5'	---
Completion	7/15	11:07 AM	9.0'	18.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.4	0.0 - 0.4 ft: Topsoil, roots		87.8			S-1, SPT 1+2+3 REC=14", 78%		0.0 ft: advanced 6 1/4" ID hollow stem auger to 18.5 ft; 0.0 to 2.5 ft interval: uniform drilling resistance, light brown silty sand cuttings; changes as noted below, see end of boring log for additional remarks 2.5 - 5.0 ft: orangish brown silty sand cuttings
	0.4 - 4.5 ft: SILTY SAND, fine to coarse grained sand, subrounded particles, moist, orangish brown, contains roots, no HCl reaction, subrounded fine gravel	SM				S-2, SPT 2+4+5 REC=14", 78%		
	2.5 ft: Changes to medium to coarse grained sand, no roots							
4.5	4.5 - 17.5 ft: POORLY GRADED SAND WITH SAND, medium to coarse grained sand, subrounded particles, moist, orangish brown, no HCl reaction		83.7		5	S-3, SPT 3+4+3 REC=11", 61%		
	7.5 ft: Changes to subrounded fine gravel, gravel fracture					S-4, SPT 1+4+5 REC=12", 67%		
					10	S-5, SPT 3+5+7 REC=16", 89%		
						S-6, SPT 1+7+5 REC=15", 83%		
	13.5 ft: Changes to wet							
	15.0 ft: Changes to estimated <5% fine gravel, subrounded fine gravel, gravel fracture				15	S-7, SPT 2+5+5 REC=16", 89%		17.5 ft: auger chatter 18.5 ft: switched to 3 1/2" OD tricone roller bit (mud rotary) and
17.5	17.5 - 23.0 ft: POORLY GRADED SAND WITH SILT, medium to coarse grained sand, subrounded particles, wet, orangish brown, no HCl reaction	SP-SM	70.7			S-8, SPT 4+12+11 REC=18", 100%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 9/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
23.0	23.0 - 42.0 ft: LEAN CLAY WITH SAND, fine grained sand, moist, gray, no HCl reaction, soft	SP-SM	65.2					advanced to 38.5 ft 18.5 - 23.5 ft: uniform drilling resistance, orangish brown drilling fluid, used Easy Seal as drilling fluid (continued)
					25	S-9, SPT 3+4+5 REC=18", 100%		
					30	S-10, SPT 2+3+4 REC=18", 100%		28.5 - 33.5 ft: light brown drilling fluid
		CL			35	S-11, SPT 3+4+7 REC=18", 100%		
	33.5 ft: Changes to firm							
					40	S-12, SPT 5+6+9 REC=18", 100%		38.5 - 40.0 ft: switched to 4" OD tricone roller bit to ream hole from 18.5 to 40 ft due to clay buildup; light gray drilling fluid
	38.5 ft: Changes to hard							40.0 - 42.5 ft: switched to 3 1/4" OD tricone roller bit and advanced to 188.5 ft; uniform drilling resistance, light gray drilling fluid
	40.0 ft: Changes to soft					S-13, SPT 1+6+8 REC=18", 100%		
42.0	42.0 - 47.0 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, no HCl reaction	SM	46.2			S-14, SPT 4+6+7 REC=18", 100%		
					45	S-15, SPT 5+8+11 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
47.0	47.0 - 49.5 ft: SILTY SAND, fine to medium grained sand, moist, orangish brown, contains mica, no HCl reaction 48.0 ft: Changes to gray	SM	41.2		S-16, SPT 2+13+29 REC=18", 300%		47.5 - 48.0 ft: jar labeled as S-16A 48.0 - 49.0 ft: jar labeled as S-16B 48.0 ft: increased drilling resistance
49.5	49.5 - 64.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, orangish brown, contains mica, no HCl reaction		38.7		50 S-17, SPT 50/5" REC=5", 104%		50.0 - 52.5 ft: uniform drilling resistance
					S-18, SPT 16+12+15 REC=12", 67%		
	55.0 ft: Changes to gray, no mica, estimated 5 - 10% shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)				55 S-19, SPT 40+50/4" REC=10", 104%		
	57.5 ft: Changes to contains shell fragments, no HCl reaction	SP-SM			S-20, SPT 50/3" REC=3", 83%		
	60.0 ft: Changes to fine to medium grained sand				60 S-21, SPT 50/5" REC=5", 104%		
	62.5 ft: Changes to estimated 15 - 25% shell fragments, weak HCl reaction, homogenous structure				S-22, SPT 18+25+33 REC=17", 94%		
64.5	64.5 - 67.0 ft: SILTY SAND, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, weak HCl reaction, homogenous structure	SM	23.7		65 S-23, SPT 50/3" REC=3", 83%		65.5 ft: drilling extremely hard and slow, considerable drilling resistance
67.0	67.0 - 69.0 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, weak HCl reaction, homogenous structure	SM	21.2		S-24, SPT 10+26+50 REC=18", 100%		67.5 ft: extremely hard and slow drilling
69.0	69.0 - 72.0 ft: SILTY SAND, fine grained sand, moist, gray, contains mica, contains shell fragments, no HCl reaction	SM	19.2		70 S-25, SPT 50/5" REC=5", 99%		70.0 - 72.5 ft: moderate drilling resistance
72.0	72.0 - 74.5 ft: SILTY SAND, fine to medium grained sand, moist, gray, estimated 5 - 10% shell fragments, homogenous structure, weak HCl reaction (with shells), no HCl reaction	SM	16.2		S-26, SPT 14+12+9 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
74.5	(with soil)	SM	13.7				72.5 - 75.0 ft: moderately uniform drilling resistance, cuttings infrequent (continued)
74.5 - 77.0 ft:	POORLY GRADED SAND WITH SILT, fine grained sand, moist, estimated 5 - 10% shell fragments, contains mica, no HCl reaction	SP-SM			75	S-27, SPT 5+4+5 REC=14", 78%	75.0 - 77.5 ft: uniform drilling resistance
77.0	77.0 - 84.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated <5% shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)		11.2			S-28, SPT 5+8+11 REC=12", 67%	
	79.5 ft: Changes to contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM			80	S-29, SPT 5+5+8 REC=18", 100%	
	81.3 ft: Changes to wet						
	82.5 ft: Changes to contains shell fragments, no HCl reaction					S-30, SPT 6+9+9 REC=18", 100%	
84.5	84.5 - 92.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, contains mica, no HCl reaction		3.7		85	S-31, SPT 5+4+5 REC=18", 100%	85.0 - 86.5 ft: uniform drilling resistance
	87.0 ft: Changes to no mica	SP-SM				S-32, SPT 3+4+5 REC=18", 100%	
	90.0 ft: Changes to moist				90	S-33, SPT 3+3+4 REC=18", 100%	
92.0	92.0 - 94.5 ft: SILTY SAND, fine grained sand, moist, gray, estimated 15 - 25% shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-3.8			S-34, SPT 4+5+8 REC=18", 100%	92.5 - 95.0 ft: uniform drilling resistance
94.5	94.5 - 99.2 ft: SILTY SAND, fine to medium grained sand, moist, light gray, estimated 30 - 45% shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-6.3		95	S-35, SPT 12+21+50/5" REC=17", 101%	95.5 - 97.0 ft: hard drilling, considerable drilling resistance
	97.5 ft: Changes to wet, estimated 5 - 10% shell fragments					S-36, SPT 14+42+29 REC=18", 100%	98.0 - 99.2 ft: rod chatter
99.2	99.2 - 104.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, weak HCl reaction (with	SP-SM	-11.0		100	S-37, SPT 18+50/5"	

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	shells), no HCl reaction (with soil)				REC=11", 102%		100.0 - 102.5 ft: uniform drilling resistance, light gray drilling fluid (continued)
104.5	102.0 ft: Changes to contains shell fragments, no HCl reaction	SP-SM			S-38, SPT 10+20+29 REC=18", 100%		
	104.5 - 112.5 ft: SILTY SAND, fine grained sand, moist, gray, contains shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)		-16.3		S-39, SPT 6+8+11 REC=18", 100%		
	107.5 ft: Changes to estimated 15 - 25% shell fragments	SM			S-40, SPT 6+9+13 REC=18", 100%		
112.5	112.5 - 117.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, contains shell fragments, contains mica, no HCl reaction	SP-SM	-24.3		S-41, SPT 4+7+8 REC=18", 100%		113.5 - 118.5 ft: uniform drilling resistance, light gray drilling fluid
117.5	117.5 - 122.5 ft: SILTY SAND, fine grained sand, moist, gray, contains shell fragments, contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-29.3		S-42, SPT 5+7+10 REC=18", 100%		
122.5	122.5 - 127.0 ft: SANDY SILT, fine grained sand, moist, gray, estimated 5 - 10% shell fragments, firm, weak HCl reaction (with shells), no HCl reaction (with soil)	ML	-34.3		S-43, SPT 7+8+9 REC=18", 100%		123.5 - 128.5 ft: infrequent cuttings of silty sand
127.0	127.0 - 132.0 ft: SILTY SAND, fine grained sand, moist, gray and white,	SM	-38.8				

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	estimated 30 - 45% shell fragments, white shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM			130	S-44, SPT 9+19+12 REC=18", 100%		
132.0	132.0 - 137.5 ft: SILTY SAND, fine grained sand, moist, gray, contains shell fragments, contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-43.8		135	S-45, SPT 5+7+8 REC=18", 100%		133.5 - 135.0 ft: uniform drilling resistance, light gray drilling fluid
137.5	137.5 - 152.5 ft: SANDY SILT, fine grained sand, moist, gray, contains mica, no HCl reaction, firm	ML	-49.3		140	S-46, SPT 5+6+9 REC=18", 100%		
					145	S-47, SPT 6+6+9 REC=18", 100%		143.5 - 145.0 ft: uniform drilling resistance, light gray drilling fluid
	148.5 ft: Changes to weak HCl reaction				150	S-48, SPT 4+5+7 REC=18", 100%		
152.5	152.5 - 157.0 ft: SILTY SAND, fine grained sand, moist, gray, no HCl reaction	SM	-64.3			S-49, SPT 5+5+8 REC=18", 100%		

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-355**
Schnabel No.: 06120048
Sheet: 7 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
157.0	157.0 - 182.0 ft: SANDY SILT, fine grained sand, moist, gray, no HCl reaction, firm	SM	-68.8		155			
						S-50, SPT 5+6+9 REC=18", 100%		158.5 - 160.0 ft: uniform drilling resistance, light gray drilling fluid
					160			
						S-51, SPT 5+8+10 REC=18", 100%		
					165			
						S-52, SPT 6+7+8 REC=18", 100%		168.5 - 173.5 ft: uniform drilling resistance, light gray drilling fluid, no solid cuttings
		ML			170			
						S-53, SPT 6+8+11 REC=18", 100%		
					175			
						S-54, SPT 4+7+8 REC=16", 89%		178.5 - 180.0 ft: uniform drilling resistance, light gray drilling fluid
					180			

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
182.0	182.0 - 191.0 ft: SANDY SILT, fine grained sand, moist, brownish gray, weak HCl reaction, firm	ML	-93.8		S-55, SPT 5+7+12 REC=18", 100%		183.5 - 188.5 ft: uniform drilling resistance, light gray drilling fluid, no solid cuttings
					S-56, SPT 6+8+9 REC=18", 100%		188.5 ft: switched to 6" OD tricone roller bit and reamed hole from 188.5 to 191.5 ft
191.0	191.0 - 197.5 ft: SILTY SAND, fine grained sand, moist, grayish brown, weak HCl reaction	SM	-102.8		UD-1, UNDIST REC=23", 96%	PP = 4.00 tsf PP = 3.50 tsf PP = 4.50 tsf	191.5 - 193.5 ft: pitcher sampler pushed 24"; 23" recovery
					S-57, SPT 6+10+12 REC=18", 100%		193.5 - 198.5 ft: switched to 3 1/4" OD tricone roller bit and advanced to 198.5; uniform drilling resistance, light gray drilling fluid, no solid cuttings
197.5	197.5 - 201.0 ft: SILTY SAND, fine grained sand, moist, grayish brown, estimated <5% shell fragments, contains mica, weak HCl reaction, highly weathered shell fragments	SM	-109.3		S-58, SPT 12+20+24 REC=9", 50%		198.5 ft: switched to 6" OD tricone roller bit to 201.5 ft
201.0	201.0 - 218.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, contains mica, no HCl reaction	SP-SM	-112.8		UD-2, UNDIST REC=23", 96%	PP = 4.50 tsf PP = 4.50 tsf PP = 3.00 tsf	201.5 - 203.5 ft: pushed pitcher sampler 24"; 23" recovery
					S-59, SPT 4+5+20 REC=16", 89%		203.5 ft: switched to 3 1/4" OD tricone roller bit and advanced to 248.5 ft 203.5 - 208.5 ft: uniform drilling resistance, light gray drilling fluid, small gravel sized sand cuttings

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-355**
Schnabel No.: 06120048
Sheet: 9 of 10

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
					210	S-60, SPT 4+5+10 REC=18", 100%		208.5 - 213.5 ft: no gravel sized sand cuttings (continued)
	213.5 ft: Changes to fine grained sand, brownish gray	SP-SM			215	S-61, SPT 4+5+10 REC=15", 83%		
218.0	218.0 - 224.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, gray, contains mica	SP-SM	-129.8		220	S-62, SPT 5+7+12 REC=18", 100%		
224.0	224.0 - 227.5 ft: SILTY SAND, fine grained sand, moist, grayish brown, contains mica, no HCl reaction	SM	-135.8		225	S-63, SPT 6+14+24 REC=16", 89%		223.5 - 225.0 ft: added 1/2 bag of bentonite to drilling fluid, borehole caved at 30 and 193 ft following casing removal
227.5	227.5 - 232.5 ft: SILTY SAND, fine grained sand, moist, brownish gray, contains mica, weak HCl reaction, homogenous structure	SM	-139.3		230	S-64, SPT 5+8+15 REC=18", 100%		225.0 - 228.5 ft: uniform drilling resistance, light gray drilling fluid; added 1/2 bag of bentonite to support sides of borehole
232.5	232.5 - 242.5 ft: SANDY SILT, fine grained sand, moist, brownish gray, contains mica, no HCl reaction, hard, homogenous structure	ML	-144.3		235	S-65, SPT 4+10+20 REC=14", 78%		233.5 - 238.5 ft: gray drilling fluid

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-355**
Schnabel No.: 06120048
Sheet: 10 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
								233.5 - 238.5 ft: gray drilling fluid (continued)
	238.5 ft: Changes to firm	ML			240	S-66, SPT 5+8+13 REC=18", 100%		
242.5	242.5 - 247.5 ft: SANDY SILT, fine grained sand, moist, brownish gray, contains mica, no HCl reaction, hard, homogenous structure	ML	-154.3		245	S-67, SPT 5+12+26 REC=14", 78%		
247.5	247.5 - 250.0 ft: SANDY SILT, fine grained sand, moist, brownish gray, contains mica, no HCl reaction, homogenous structure	ML	-159.3			S-68, SPT 4+7+11 REC=13", 72%		
250.0			-161.8		250			

Bottom of Boring at 250.0 ft.

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-356**
Schnabel No.: 06120048
Sheet: 1 of 10

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Connelly

Schnabel Representative: P. Patrick/K. Bell

Equipment: CME-75 (Truck); AWJ/NWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger.
3-1/2" O.D. Tri-cone Roller Bit,
6" O.D. Tri-cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/8/08 **Finished:** 7/16/08

Easting: 961260 ft **Northing:** 216964 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 120± (ft) **Total Depth:** 250.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/8	---	23.5'	18.5'	---
Start of Day	7/9	7:10 AM	6.0'	18.5'	---
Start of Day	7/11	---	18.4'	18.5'	---
Start of Day	7/14	8:00 AM	43.5'	18.5'	---
Start of Day	7/15	7:00 AM	17.0'	18.5'	---
Completion	7/16	7:00 AM	13.0'	18.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.5	0.0 - 0.5 ft: FILL, sampled as poorly graded gravel with silt and sand, fine to coarse grained sand, moist, dark gray, no HCl reaction, subrounded to subangular gravel, flat and elongated from 0 to 0.5 ft	FILL	119.5			S-1, SPT 4+3+6 REC=18", 100%		0.0 ft: advanced 61/4" ID HSA to 18.5 ft; 0.0 - 2.5 interval: slight chatter to 0.5 ft (possible gravel)
2.5	0.5 - 2.5 ft: FILL, sampled as clayey sand, fine to medium grained sand, moist, orangish brown, estimated <5% roots, estimated <5% fine gravel, no HCl reaction	FILL	117.5			S-2, SPT 3+3+3 REC=10", 56%		2.5 ft: uniform drilling resistance, changes as noted below, see end of boring log for additional remarks
6.0	2.5 - 6.0 ft: PROBABLE FILL, sampled as clayey sand, fine to coarse grained sand, moist, brown and orangish brown, no HCl reaction, contains 0.2 inch layer of sandy clay, moist, gray at 2.6 ft	SP-SM	114.0		5	S-3, SPT 2+2+2 REC=13", 72%		5.0 ft: soft drilling
7.0	6.0 - 7.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, yellowish brown, no HCl reaction, color changes to yellowish brown at 5.4 ft	SC	113.0			S-4, SPT 3+2+3 REC=10", 56%		7.5 ft: easy drilling
10.6	7.0 - 10.6 ft: CLAYEY SAND, fine to medium grained sand, moist, orangish brown, contains mica, no HCl reaction	CL	109.4		10	S-5, SPT 4+7+9 REC=18", 100%		10.0 - 10.6 ft: jar labeled as S-5A 10.0 ft: soft drilling 10.6 - 11.5 ft: jar labeled as S-5B
12.5	10.6 - 12.5 ft: SANDY LEAN CLAY, fine grained sand, moist, gray and orangish brown, no HCl reaction, soft to very soft		107.5					
17.0	12.5 - 17.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, orangish brown and gray, contains mica, no HCl reaction, contains a 2.5 inch layer of sandy lean clay, moist, gray and speckled orange at 14.5 ft	SP-SM	103.0		15	S-6, SPT 11+8+16 REC=18", 100%		13.5 - 15.0 ft: hammer energy test performed 13.5 ft: harder drilling 14.0 ft: cuttings change to yellowish brown
	17.0 - 22.0 ft: POORLY GRADED SAND, fine to coarse grained sand, subangular particles, moist, gray and orangish brown, estimated <5% silt, no HCl reaction	SP				S-7, SPT 20+19+22 REC=18", 100%		18.5 ft: switched to 3 1/2" OD tricone roller bit (mud rotary)

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
22.0	22.0 - 27.0 ft: POORLY GRADED SAND, fine to coarse grained sand, subrounded to subangular particles, wet, yellowish brown and reddish brown, no HCl reaction, contains 0.4 inch layer of silty sand, wet, reddish brown at 24.0 ft; coarse sand from 24.0 to 24.0 ft	SP	98.0				drilling) and advanced to 221.5 ft; uniform drilling 19.5 ft: yellowish brown drilling fluid
		SP			S-8, SPT 11+8+12 REC=18", 100%		24.5 ft: reddish brown drilling fluid
27.0	27.0 - 32.0 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, rounded to subrounded particles, wet, yellowish brown and orangish brown, no HCl reaction	SP-SM	93.0				28.5 ft: orangish brown drilling fluid 29.5 ft: slight rig chatter (possible gravel)
		SP			S-9, SPT 7+8+10 REC=10", 56%		
32.0	32.0 - 37.0 ft: POORLY GRADED SAND, fine to coarse grained sand, subrounded to subangular particles, wet, yellowish brown, estimated <5% silt, no HCl reaction	SP	88.0				33.5 - 43.5 ft: drillers thickened drilling fluid
		SP			S-10, SPT 16+17+18 REC=12", 67%		
37.0	37.0 - 42.0 ft: CLAYEY SAND, fine to medium grained sand, wet, orangish brown and gray, no HCl reaction	SC	83.0				
		SC			S-11, SPT 2+4+6 REC=14", 78%		
42.0	42.0 - 47.0 ft: SILTY SAND, fine to medium grained sand, wet, reddish brown and orangish brown, no HCl reaction, contains a 0.2 inch lean clay with sand layer at 44.5 ft, moist, gray	SM	78.0				43.5 - 45.0 ft: hammer energy test performed
		SM			S-12, SPT 2+2+3 REC=17", 94%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
47.0	47.0 - 57.0 ft: SANDY LEAN CLAY, fine grained sand, wet, dark gray, contains mica, no HCl reaction, very soft to soft, homogenous structure	CL	73.0				48.5 ft: gray drilling fluid, softer drilling
	53.5 ft: Changes to soft				S-13, SPT 3+4+4 REC=18", 100%		
					50		
					S-14, SPT 2+3+2 REC=21", 117%		
					55		
57.0	57.0 - 70.5 ft: LEAN CLAY, moist, gray, estimated <5% fine grained sand, contains mica, no HCl reaction, soft to firm, homogenous structure	CL	63.0				58.5 ft: slightly harder drilling 58.5 - 60.5 ft: dropped rods in hole, unable to sample, drill down 2 ft to get next sample, easy drilling 60.5 - 62.0 ft: hammer energy test performed 60.5 ft: easy drilling
	63.5 ft: Changes to firm				S-15, SPT 3+3+5 REC=18", 100%		
					60		
	68.5 ft: Changes to hard				S-16, SPT 3+5+5 REC=18", 100%		
					65		
70.5	70.5 - 73.0 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, contains mica, no HCl reaction, hard, homogenous structure, contains 0.5 inch layer of SILTY SAND (SM), fine sand, moist, dark gray at 71.5 ft	CL	49.5				
					S-17, SPT 3+5+7 REC=18", 100%		
					70		
					S-18, SPT 3+5+6 REC=18", 100%		
					73.0		
73.0	73.0 - 75.5 ft: SANDY LEAN CLAY, fine to medium grained sand, gray and	CL	47.0				
					S-19, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
75.5	greenish gray, no HCl reaction, soft to very soft, homogenous structure	CL	44.5		75	4+5+5 REC=18", 100%		73.5 - 75.0 ft: hammer energy test performed (continued)
77.5	75.5 - 77.5 ft: SANDY LEAN CLAY, fine to medium grained sand, gray, no HCl reaction, hard, homogenous structure	CL	42.5			S-20, SPT 11+14+26 REC=13", 72%		
80.0	77.5 - 80.0 ft: SILTY SAND, fine grained sand, wet, orangish brown and yellowish brown, estimated <5% shell fragments, fresh shell fragments, contain 1.5 inch layer of sandy lean clay, fine sand, moist, gray at 79.0 ft, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	40.0		80	S-21, SPT 17+20+50/5" REC=15", 88%		77.5 ft: harder drilling (possible shells)
	80.0 - 90.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, brown and yellowish brown, no HCl reaction, homogenous structure					S-22, SPT 50/4" REC=4", 83%		80.0 ft: rig chatter (possible shells)
	83.5 ft: Changes to yellowish brown					S-23, SPT 50/6" REC=6", 100%		81.5 ft: heavy rig chatter (possible cemented sand) 82.5 ft: softer drilling
	86.0 ft: Changes to gray and light gray	SP-SM			85	S-24, SPT 50/4" REC=4", 83%		83.5 - 85.0 ft: hard drilling
	88.5 ft: Changes to gray					S-25, SPT 50/4" REC=3", 62%		
90.0	90.0 - 93.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, no HCl reaction, homogenous structure	SP-SM	30.0		90	S-26, SPT 15+11+33 REC=13", 72%		86.0 - 88.5 ft: harder drilling
93.0	93.0 - 98.0 ft: SANDY LEAN CLAY, fine grained sand, wet, estimated <5% shell fragments, firm to soft, homogenous structure, weak HCl reaction (with shells and soil)		27.0			S-27, SPT 3+50/3" REC=12", 125%		88.5 - 88.9 ft: hammer energy test performed 88.5 ft: hard drilling
	96.0 ft: Changes to firm, contains 0.5 ft strongly cemented layer at 96.0 ft, shells increase with depth	CL			95	S-28, SPT 21+13+46 REC=18", 100%		93.0 ft: Schnabel representative changed to P. Patrick 93.4 ft: slight rig chatter (possible cemented sands) 93.5 ft: very hard drilling (possible shells) 96.0 ft: hard drilling (possible shells)
98.0	98.0 - 100.5 ft: CLAYEY SAND, fine grained sand, wet, gray, estimated <5% shell fragments, fresh shell fragments, weak HCl reaction (with shells and soil)	SC	22.0			S-29, SPT 4+8+8 REC=19", 106%		
100.5	100.5 - 101.5 ft: SANDY LEAN CLAY,	CL	19.5		100			

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
101.5	fine grained sand, wet, gray and light gray, estimated <5% shell fragments, soft to firm, homogenous structure, weak HCl reaction (with shells and soil) 101.0 - 113.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated <5% shell fragments, weak HCl reaction, homogenous structure, fresh shell fragments	CL	18.5			S-30, SPT 50/4" REC=3", 83%		100.5 ft: hard drilling (possible shells)
					105	S-31, SPT 6+9+11 REC=16", 89%		103.5 - 105.0 ft: hammer energy test performed
	106.0 ft: Changes to moderately weathered shell fragments, weak HCl reaction with shells, shell content increases with depth	SP-SM				S-32, SPT 6+11+16 REC=17", 94%		
					110	S-33, SPT 6+7+8 REC=18", 100%		
	111.0 ft: Changes to fresh shell fragments					S-34, SPT 6+8+12 REC=16", 89%		
113.0	113.0 - 122.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray and dark gray, estimated <5% shell fragments, weak HCl reaction, homogenous structure, moderately weathered shell fragments 115.5 ft: Changes to highly weathered shell fragments 118.0 ft: Changes to gray	SP-SM	7.0			S-35, SPT 6+11+13 REC=18", 100%		
					115	S-36, SPT 4+6+9 REC=16", 89%		
					120	S-37, SPT 3+3+4 REC=18", 100%		
122.0	121.0 ft: Changes to fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil), shells increase with depth 122.0 - 124.0 ft: SANDY FAT CLAY, fine grained sand, wet, gray, estimated <5% shell fragments, weak HCl reaction, soft to firm, fresh shell fragments	CH	-2.0			S-38, SPT 4+4+4 REC=18", 100%		
124.0	124.0 - 125.5 ft: CLAYEY SAND, fine grained sand, wet, gray, estimated 15 - 25% shell fragments, fresh to moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SC	-4.0			S-39, SPT 3+4+8 REC=17", 94%		123.5 - 124.0 ft: jar labeled as S-39A
125.5	125.5 - 128.0 ft: SANDY LEAN CLAY, fine grained sand, wet, gray, estimated	CL	-5.5			S-40, SPT 12+19+26 REC=18", 100%		124.0 - 125.0 ft: jar labeled as S-39B

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
128.0	5 - 10% shell fragments, weak HCl reaction, firm to soft, homogenous structure, moderately to highly weathered shell fragments, amount of shells increased with depth	CL	-8.0					
129.2	128.0 - 129.2 ft: SANDY LEAN CLAY, fine grained sand, wet, gray, estimated <5% shell fragments, weak HCl reaction, firm, moderately weathered shell fragments	SC	-9.2			S-41, SPT 12+16+25 REC=18", 100%		128.5 - 129.2 ft: jar labeled as S-41A
130.5	129.2 - 130.5 ft: CLAYEY SAND, fine grained sand, wet, gray, estimated <5% shell fragments, strong HCl reaction	SP-SM	-10.5			S-42, SPT 16+27+32 REC=16", 89%		129.2 - 130.0 ft: jar labeled as S-41B
133.0	130.5 - 133.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated <5% shell fragments, weak HCl reaction, homogenous structure, moderately weathered shell fragments, shells increase with depth	SP	-13.0			S-43, SPT 5+8+13 REC=18", 100%		131.0 - 136.0 ft: rig chatter (possible shell fragments)
135.5	133.0 - 135.5 ft: POORLY GRADED SAND WITH SAND, fine grained sand, wet, gray, estimated <5% shell fragments, weak HCl reaction, homogenous structure, moderately weathered shell fragments	SM	-15.5			S-44, SPT 4+5+10 REC=18", 100%		
138.0	135.5 - 138.0 ft: SILTY SAND, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, fresh shells, strong HCl reaction (with shells), moderate HCl reaction (with soil), shells increase with depth	CL	-18.0			S-45, SPT 3+5+11 REC=18", 100%		138.5 - 139.2 ft: jar labeled as S-45A
139.2	138.0 - 139.2 ft: SANDY LEAN CLAY, fine grained sand	SM	-19.2					139.2 - 140.0 ft: jar labeled as S-45B
140.0	139.2 - 140.0 ft: SILTY SAND, fine grained sand, wet, gray, estimated 15 - 25% shell fragments, fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-20.0			S-46, SPT 5+6+8 REC=18", 100%		
147.0	140.0 - 147.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated <5% shell fragments, weak HCl reaction, homogenous structure, highly weathered shell fragments		-27.0					
	147.0 - 157.0 ft: CLAYEY SAND, fine grained sand, wet, gray, estimated <5% shell fragments, weak HCl reaction, highly weathered shell fragments, running sands from 149.8 - 150 ft	SC				S-47, SPT 6+6+8 REC=17", 94%		148.5 - 150.0 ft: hammer energy test performed
	153.5 ft: Changes to homogenous structure, fresh to moderately weathered shell fragments, strong HCl					S-48, SPT 5+6+7 REC=18", 100%		153.5 - 158.5 ft: mixed new batch of drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
157.0	reaction (with shells), weak HCl reaction (with soil)	SC	-37.0		155			153.5 - 158.5 ft: mixed new batch of drilling fluid (continued)
162.0	157.0 - 162.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, homogenous structure, fresh pink and white shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-42.0		160	S-49, SPT 6+11+23 REC=14", 78%		
167.0	162.0 - 167.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated <5% shell fragments, homogenous structure, fresh pink and white shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP	-47.0		165	S-50, SPT 4+5+7 REC=18", 100%		163.5 - 165.0 ft: hammer energy test performed
	167.0 - 182.0 ft: SANDY SILT, fine grained sand, wet, gray, estimated <5% shell fragments, homogenous structure, fresh shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	ML			170	S-51, SPT 4+6+9 REC=18", 100%		168.5 - 173.5 ft: easy (soft) drilling
	175.5 ft: Changes to dark gray, estimated <5% shell fragments, weak HCl reaction, firm, moderately weathered shell fragments				175	S-52, SPT 3+6+7 REC=16", 67%		173.5 ft: attempted to take sample but dropped sample (sample penetrated 18 inches); drilled 2 ft past top of previous sample to take another sample
	178.5 ft: Changes to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)				180	S-53, SPT 6+3+8 REC=18", 100%		178.5 - 180.0 ft: hammer energy test performed

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
182.0	182.0 - 187.0 ft: SANDY ELASTIC SILT, fine grained sand, wet, dark brownish gray, estimated <5% shell fragments, weak HCl reaction, firm, homogenous structure, highly weathered shell fragments	MH	-62.0		S-54, SPT 5+5+6 REC=18", 100%		
187.0	187.0 - 192.0 ft: LEAN CLAY WITH SAND, fine grained sand, wet, brownish gray, weak HCl reaction, firm, homogenous structure, sand increases with depth	CL	-67.0		S-55, SPT 5+5+6 REC=18", 100%		
192.0	192.0 - 197.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, greenish gray, weak HCl reaction, sand increases with depth	SP-SM	-72.0		S-56, SPT 4+7+8 REC=18", 100%		
197.0	197.0 - 202.0 ft: CLAYEY SAND, fine grained sand, wet, gray, no HCl reaction, homogenous structure	SC	-77.0		S-57, SPT 5+7+8 REC=18", 100%		
202.0	202.0 - 207.0 ft: SILTY SAND, fine grained sand, wet, gray, strong HCl reaction, homogenous structure, fines increase with depth	SM	-82.0		S-58, SPT 5+8+11 REC=18", 100%		
207.0	207.0 - 223.0 ft: SANDY SILT, fine grained sand, wet, brownish gray, weak HCl reaction, firm, homogenous structure	ML	-87.0				

193.5 - 195.0 ft:
hammer energy
test performed

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
					210	S-59, SPT 5+6+8 REC=18", 100%		208.5 ft: easy drilling 208.5 - 210.0 ft: hammer energy test performed (continued)
					215	S-60, SPT 5+6+9 REC=18", 100%		
					220	S-61, SPT 6+7+10 REC=18", 100%		
						UD-1, UNDIST REC=13", 68%		
223.0	223.0 - 228.0 ft: SILT, moist, olive and greenish gray, estimated <5% fine grained sand, weak HCl reaction, hard, homogenous structure	ML	-103.0			UD-2, UNDIST REC=18", 75%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	221.5 - 222.6 ft: pushed Shelby tube, 13 inches, poor recovery, (labeled jar as UD-1)
	225.0 ft: Changes to estimated <5% fine grained sand, estimated <5% shell fragments, weak HCl reaction, fine sand size highly weathered shell fragments	ML			225	S-62, SPT 5+8+9 REC=18", 100%		221.5 ft: Schnabel representative changed to K. Bell
228.0	228.0 - 231.0 ft: SILTY SAND, fine to medium grained sand, wet, gray and light gray, estimated 5 - 10% shell fragments, fine to medium sand size highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-108.0			S-63, SPT 7+9+12 REC=14", 78%		221.5 ft: Driller switched to 6" OD tricone roller bit and advanced to 221.5 ft; 223.0 ft: driller added clean water to drilling fluid, driller washed and reamed while advancing (every 2.0 ft), uniform resistance, greenish gray and brownish gray, drilling fluid, NWJ rods used during drilling
231.0	231.0 - 237.0 ft: SILTY SAND, fine to medium grained sand, wet, gray, estimated <5% shell fragments, fine to coarse sand size fresh to moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-111.0			UD-3, UNDIST REC=24", 100%	PP = 2.50 tsf PP = 2.00 tsf PP = 3.00 tsf PP = 2.00 tsf PP = 2.50 tsf	225.0 - 226.5 ft: hammer energy test performed
					235	S-64, SPT 7+14+16 REC=18", 100%		225.1 ft: switched to 3 1/2" OD tricone roller bit and advanced to 231.5 ft; uniform

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-356**
Schnabel No.: 06120048
Sheet: 10 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
237.0		SM	-117.0					resistance; hard drilling, greenish gray drilling fluid
	237.0 - 241.0 ft: SILTY SAND, fine grained sand, wet, olive, estimated <5% shell fragments, weak HCl reaction, homogenous structure, fine sand sized highly weathered shell fragments	SM						231.5 - 241.5 ft: advanced 6" OD tricone roller bit; driller added clean water to mud tub, uniform resistance, smooth drilling, greenish gray and olive gray drilling fluid, driller used NWJ rods while drilling (continued)
	239.5 ft: Changes to olive and gray				240	S-65, SPT 4+6+9 REC=18", 100%		238.5 - 240.0 ft: hammer energy test performed
241.0	241.0 - 250.0 ft: SILTY SAND, fine grained sand, moist, greenish gray and olive gray, estimated <5% shell fragments, weak HCl reaction, fine sand size, highly weathered shell fragments		-121.0			UD-4, UNDIST REC=24", 100%		241.5 - 248.5 ft: switched to 3 1/2" tricone roller bit and advanced to 250.0 ft; driller used AWJ rods for drilling, uniform drilling, greenish gray drilling fluid
		SM			245	S-66, SPT 5+7+10 REC=17", 94%		
	248.5 ft: Changes to fine sand size, moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)					S-67, SPT 4+5+6 REC=18", 100%		248.5 - 250.0 ft: performed hammer energy test
250.0			-130.0		250			

Bottom of Boring at 250.0 ft.
Pulled augers and grouted boring.
Boring terminated at selected depth (250 ft)
Boring backfilled per procedures



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-357**
Schnabel No.: 06120048
Sheet: 1 of 5

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: M. Lark

Schnabel Representative: W. Bradfield

Equipment: CME-75 (Truck); AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-cone Roller Bit,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 6/24/08 **Finished:** 7/8/08

Easting: 961176.1 ft **Northing:** 216925.8 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 105± (ft) **Total Depth:** 105.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Start of Day ▼	6/25	6:55 AM	8.6'	13.5'	---
Start of Day ▼	6/27	8:12 AM	65.2'	78.5'	---
Start of Day ▼	7/1	7:11 AM	3.6'	79.0'	---
Start of Day ▼	7/3	8:00 AM	22.8'	79.0'	---
Start of Day ▼	7/8	7:11 AM	55.1'	79.0'	---
Completion	7/8	5:46 PM	Na	---	30.2'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.7	0.0 - 0.7 ft: Asphalt, brick fragments, roots	FILL	104.0			S-1, SPT 1+2+3 REC=21", 117%		0.0 ft: Advanced 6 1/4 HSA to 15.0 ft, smooth, uniform drilling, orangish brown cuttings; changes as noted below, see end of boring for additional remarks
2.0	0.7 - 2.0 ft: PROBABLE FILL, sampled as silty sand, fine to medium grained sand, moist, yellowish brown, estimated 5 - 10% roots, no HCl reaction, homogenous structure		102.7			S-2, SPT 1+2+5 REC=12", 67%		0.0 - 0.7 ft: Jar labeled as S-1A
	2.0 - 23.0 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, subrounded to subangular particles, moist, orangish brown with bands of light yellowish brown, no HCl reaction, stratified, 1/2" to 1" alternating color layers	SP-SM			5	S-3, SPT 1+5+6 REC=16", 89%		0.7 - 1.5 ft: Jar labeled as S-1B
	5.0 ft: Changes to light yellowish brown with bands of orangish brown, 1" to 3" of alternating color							
	7.5 ft: Changes to subangular to rounded particles, light orangish brown, homogenous structure				10	S-4, SPT 2+2+2 REC=13", 72%		6.5 - 11.5 ft: light yellowish brown cuttings
	10.0 ft: Changes to light yellowish brown and light brown, 1/8" layer of LEAN CLAY (CL), moist, light gray at 11.4 ft					S-5, SPT 2+4+7 REC=14", 78%		
	13.5 ft: Changes to subrounded to subangular particles, light yellowish brown and light orangish brown, contains 1/8" layer of LEAN CLAY (CL), moist, light gray at 14.6 ft				15	S-6, SPT 3+6+9 REC=12", 67%		11.5 - 13.5 ft: light orangish brown cuttings
	18.5 ft: Changes to subangular to rounded particles, light brown and light yellowish brown, estimated <5% fine gravel, stratified, rounded fine gravel,					S-7, SPT 4+5+11 REC=9", 50%		13.5 - 15.0 ft: SPT Hammer Energy Test performed
								15.0 ft: Driller switched from 6 1/4 ID auger to 3 1/2 OD tricone roller bit (mud rotary) and advanced to 105.0 ft smooth, uniform drilling, light brownish gray drilling fluid
								18.5 ft: Approx 30 gal of drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	contains 0.5 inch layer of SILTY SAND (SM), moist, orangish brown at 19.7 ft, 1/4" to 1" layer of alternating color	SP-SM					fluid lost due to lean mud mix thickened drilling fluid
23.0	23.0 - 28.5 ft: CLAYEY SAND, fine to medium grained sand, wet, orangish brown with mottles of light gray, no HCl reaction	SC	81.7		S-8, SPT 1+1+2 REC=16", 89%		23.0 ft: dark brown drilling fluid
28.5	28.5 - 32.0 ft: SILTY SAND, fine grained sand, dark gray, contains mica, no HCl reaction, homogenous structure	SM	76.2		S-9, SPT 3+1+2 REC=16", 89%		25.5 - 26.0 ft: slightly harder drilling (possible gravel layer), light brown drilling fluid
32.0	32.0 - 37.0 ft: CLAYEY SAND, fine grained sand, wet, dark gray, contains mica, no HCl reaction	SC	72.7		S-10, SPT 1+1+3 REC=17", 94%		28.5 - 30.0 ft: Hammer Energy Test performed
37.0	37.0 - 47.0 ft: LEAN CLAY WITH SAND, moist, dark gray, contains mica, no HCl reaction, soft, homogenous structure	CL	67.7		S-11, SPT 3+3+4 REC=18", 100%		30.0 ft: Thickened mud to remove gravel slough, light grayish brown drilling fluid
					S-12, SPT 3+6+6 REC=18", 100%		35.0 ft: gray drilling fluid
							43.5 - 45.0 ft: Hammer Energy test performed

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-357
Schnabel No.: 06120048
Sheet: 3 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
47.0	47.0 - 49.0 ft: SANDY LEAN CLAY, fine grained sand, moist, gray with bands of dark gray, estimated <5% organics, contains mica, no HCl reaction, firm, organics are plant matter	CL	57.7					
49.0	49.0 - 49.3 ft: CLAYEY SAND, fine grained sand, wet, dark gray, contains mica, no HCl reaction	SC	55.7					
49.3	49.3 - 55.5 ft: LEAN CLAY WITH SAND, fine grained sand, moist, gray, contains mica, no HCl reaction, firm	CL	55.4		50	S-13, SPT 4+5+6 REC=18", 100%		48.5 - 49.0 ft: Jar labeled as S-13A 49.0 - 49.3 ft: Jar labeled as S-13B 49.3 - 50.0 ft: Jar labeled as S-13C 50.0 ft: slightly harder resistance
55.5	55.5 - 58.0 ft: SILTY SAND, fine to medium grained sand, moist, dark gray, contains mica, no HCl reaction	SM	49.2		55	S-14, SPT 5+8+10 REC=18", 100%		53.5 ft: Hole blocked by clay plug @ ~ 20 ft, driller added clay inhibitor fluid to break down clay, gray drilling fluid with some clay cuttings 55.0 ft: Began continuous sampling from El +50 to -20
58.0	58.0 - 62.1 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, moist, dark gray, estimated <5% cemented sands, no HCl reaction, weak cementation, coarse sand cumble	SP-SM	46.7		60	S-15, SPT 5+6+7 REC=18", 100%		58.5 - 60.0 ft: Hammer Energy Test performed
62.1	61.0 ft: Changes to subangular particles, with bands of dark orangish brown, estimated 5 - 10% cemented sands, estimated <5% shell fragments, no HCl reaction, moderate cementation, highly weathered shell fragments, shell fragments are dark orangish brown	SM	42.6			S-16, SPT 6+13+22 REC=18", 100%		61.0 - 62.1 ft: Jar labeled as S-17A
63.4	62.1 - 63.4 ft: SILTY SAND, fine to coarse grained sand, angular to subrounded particles, moist, dark brown with bands of yellowish brown, estimated 15 - 25% cemented sands, moderate cementation, strong HCl reaction with yellowish brown layers, no HCl reaction (with shells or soil), shell imprints are highly oxidized, no HCl reaction	SP-SM	41.3			S-17, SPT 12+32+21 REC=12", 67%		62.1 - 62.5 ft: Jar labeled as S-17B 62.1 ft: Harder drilling due to cemented sands
65.5	63.4 - 65.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, light yellowish brown with mottles of dark reddish brown, no HCl reaction	SP	39.2		65	S-18, SPT 9+12+15		
70.5	65.5 - 70.5 ft: POORLY GRADED SAND, fine to medium grained sand, wet, light brown, estimated <5% silt, no HCl reaction, homogenous structure	SP	34.2		70	S-19, SPT 23+26+25 REC=17", 94%		66.0 ft: light gray drilling fluid
73.0	68.5 ft: Changes to fine grained sand	SP				S-20, SPT 21+20+3 REC=15", 83%		
	70.5 - 73.0 ft: POORLY GRADED SAND, fine grained sand, wet, gray, estimated <5% silt, contains mica, no HCl reaction, homogenous structure	SP-SM	31.7			S-21, SPT 14+9+7 REC=11", 61%		
						S-22, SPT		73.0 ft: Faster drilling rate at 73

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
74.2	73.0 - 74.2 ft: POORLY GRADED SAND WITH SILT AND GRAVEL, fine to medium grained sand, wet, gray and brown, no HCl reaction, gravel as cemented sands, rounded gravel, no HCl reaction in cemented sands	SM	30.5		75	2+4+8 REC=18", 100%		ft (very soft material) 73.5 ft: Lost drilling fluid through auger casing @ 73.5 ft (~ 100 gals)
75.5	74.2 - 75.5 ft: SILTY SAND, fine to coarse grained sand, subrounded to subangular particles, wet, light gray and light brownish white, estimated 50 - 100% shell fragments, estimated <5% organics, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	29.2			S-23, SPT 7+11+11 REC=6", 33%		73.5 - 75.0 ft: Hammer Energy Test performed (continued)
78.0	75.5 - 78.0 ft: SILTY SAND, fine to medium grained sand, moist, gray and brownish white, estimated 30 - 45% shell fragments, weak cementation, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	26.7			S-24, SPT 50/1" REC=1", 83%		73.5 - 74.2 ft: Jar labeled as S-22A (continued)
80.9	78.0 - 80.9 ft: SILTY SAND, fine to medium grained sand, moist, gray, estimated 50 - 100% cemented sands, estimated 5 - 10% shell fragments, strong cementation, strong HCl reaction (with cemented sands), strong HCl reaction (with shells)	SM	23.8		80	S-25, SPT 13+24+54/1" REC=13", 98%		74.2 - 75.0 ft: Jar labeled as S-22B
85.2	80.0 ft: Changes to fine to coarse grained sand, rounded particles, estimated 5 - 10% cemented sands, estimated <5% shell fragments, strong HCl reaction (with shells), strong HCl reaction (with cemented sands), weak HCl reaction (with soil), weak to moderate cementation, coarse sand probably due to cemented sand	SM	19.5			S-26, SPT 50/2.5" REC=2.5", 104%		79.0 ft: rig chatter, hard drilling, slow advancement
	80.9 - 85.2 ft: SILTY SAND WITH GRAVEL, fine to coarse grained sand, rounded particles, moist, gray, estimated <5% shell fragments, subangular to angular fine gravel, strong HCl (with shells), strong HCl (with cemented sands), weak HCl (with soil), moderate to strong cementation, coarse sand to fine gravel crumble, coarse sand and fine gravel as cemented sands	SP-SM			85	S-27, SPT 12+12+11 REC=18", 100%		80.0 - 80.9 ft: Jar labeled as S-25A
	83.5 ft: Changes to angular to subrounded particles, light brownish gray, estimated 15 - 25% shell fragments, weak to moderate cementation, coarse sand and fine gravel consist as shell fragments and cemented sands				90	S-28, SPT 7+11+22 REC=17", 94%		80.9 - 81.1 ft: Jar labeled as S-25B
	85.2 - 95.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray with streaks of brownish white, estimated 5 - 10% shell fragments, fresh to highly weathered shell fragments, strong HCl (with shells), no HCl reaction (with soil), shell fragments are brownish white	SM	9.2			S-29, SPT 8+6+7 REC=17", 94%		82.1 ft: easier drilling
98.0	90.5 ft: Changes to fine to coarse grained sand, light gray with speckles of brownish white, estimated 30 - 45% shell fragments	SM	6.7			S-30, SPT 5+9+10 REC=17", 94%		83.2 ft: gray drilling fluid w/ silt cuttings, harder drilling, slow advancement
100.5	93.5 ft: Changes to fine to medium grained sand, gray with speckles of brownish white, estimated 15 - 25%	SP-SM	4.2		95	S-31, SPT 8+12+16 REC=18", 100%		85.2 ft: rig chatter, easier drilling
					100	S-32, SPT 7+10+12 REC=18", 100%		88.5 - 90.0 ft: Hammer Energy Test performed

(continued)

**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-357**
Schnabel No.: 06120048
Sheet: 5 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
105.0	shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil) 95.5 - 98.0 ft: SILTY SAND, fine to medium grained sand, wet, gray, estimated <5% shell fragments, medium sand sized fresh shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil) 98.0 - 100.5 ft: SILTY SAND, fine to coarse grained sand, rounded to subrounded particles, wet, brownish gray, estimated 5 - 10% shell fragments, coarse sand size fresh to highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil), contains "hair-like" features, possibly organic in nature 100.5 - 105.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, contains mica, highly weathered shell fragments, no HCl reaction (with shells and soil) 103.5 ft: Changes to moderate to highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with highly weathered shells), no HCl reaction (with soil) Bottom of Boring at 105.0 ft. Terminated boring due to lack of return and grout/bentonite mud take as requested NOTE: Negative groundwater depth denotes water level above ground surface (i.e. "negative depth"), but does not necessarily imply artesian conditions	SP-SM	-0.3			S-33, SPT 3+4+8 REC=18", 100% S-34, SPT 3+3+3 REC=18", 100%		101.0 - 103.5 ft: Hammer Energy Test performed

Additional Remarks
75 ft: Tape advanced to 69 ft but difficult to tell mud elevation due to clay in boring and use of mud, caving heard from ground level, driller thickened mud to attempt closing off mud loss zone, pumped in additional ~ 340 gal of thick mud without return (total mud taken ~ 440 gals);
allowed mud to sit overnight, added more drilling fluid next morning and advanced HSA casing to seal off mud loss zone
75.5 ft: Additional 100 gal of very thick grout without return, only raised depth of mud from 62.5 ft bgs to 58 ft bgs, advanced 6 1/4" ID auger to 76 ft; reamed out hole
79.0: Added ~ 300 gal of bentonite mud to borehole; only raised depth of mud from 65.2 to 60 ft (no return); augers were advanced from 40 to 79 ft to clean out borehole. Reamed out augers with 3 1/2 OD tricone and bentonite mud; achieved return from top of augers after pumping in 50 gal of mud
105 ft: 40 ft of rods slipped through ring and into borehole, unable to retrieve; numerous attempts made to retrieve 40 ft of rods in borehole with a variety of methods; rods retrieved successfully
During reaming of borehole after retrieving rods, ~ 50 gal of mud lost (mud at 62 ft bgs), added 10 lbs of plugz-it to 50 gal of mud and pumped into borehole, no mud return, 2nd attempt using ~15 lbs of plugz-it to 50 gal of mud, pumped in without return, called plugz-it supplier; recommended adding as much plugz-it to mud as pumpable and allow to hydrate overnight; 3rd attempt using 30 lbs plugz-it to 50 gal of mud. Please refer to original field log for End of Day groundwater observation depths

**TEST
BORING
LOG****Project:** CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257**Boring Number:** **B-357A**
Schnabel No.: 06120048
Sheet: 1 of 10**Contractor:** Connelly and Associates, Inc.
Frederick, Maryland**Contractor Foreman:** T. Chew**Schnabel Representative:** P. Patrick/K. Bell**Equipment:** CME-75 (Truck); AWJ Rods**Method:** 6-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-cone Roller Bit,
3-3/4" O.D. Tri-cone Roller Bit/4-3/4" O.D. Tri-cone**Hammer Type:** Auto Hammer (140 lb)**Dates Started:** 7/24/08 **Finished:** 8/25/08**Easting:** 961168 ft **Northing:** 216931 ft**Coordinate System:** MD State Plane**Ground Surface Elevation:** 105± (ft) **Total Depth:** 250.0 ft**Groundwater Observations**

	Date	Time	Depth	Casing	Caved
Start of Day	7/25	7:00 AM	Dry	9.5'	---
Start of Day	7/28	8:00 AM	35.0'	9.5'	---
Start of Day	7/29	7:00 AM	4.5'	99.0'	---
Start of Day	7/30	---	7.0'	99.0'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	0.0 - 107.5 ft: see B-357 for lithologic description							0.0 ft: advanced 6-1/4 ID HSA to 9.5 ft; see end of boring log for additional remarks
					5			
					10			9.5 ft: switched to 3-3/4" OD tricone roller bit (mud rotary) and advanced to 61.7 ft, driller mixed 2 bags of bentonite with 150 gallons of water (drilling fluid); see end of boring log for additional remarks
					15			

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-357A**
Schnabel No.: 06120048
Sheet: 2 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
					25			25.0 ft: see end of boring log for remarks
					30			
					35			
					40			
					45			

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**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-357A**
Schnabel No.: 06120048
Sheet: 3 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
					50			
					55			
					60			
					65			
					70			
								61.5 ft: lost drilling fluid in augers, driller mixed thick drilling fluid and pumped ~ 100 gallons from the hole with no return; driller attempted to pump drilling fluid (rods were clogged with fluid and had to be broken down) 61.7 ft: driller tried to advance 3-3/4 OD tricone roller bit (using drilling fluid left sitting overnight), drilling fluid soaked off at 61.5 ft but once driller advanced past the seal, lost ~ 50 gallons drilling fluid

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-357A**
Schnabel No.: 06120048
Sheet: 4 of 10

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
					75			74.0 ft: see end of boring log for remarks
					80			
					85			
					90			
					95			
					100			98.5 ft: drillers advanced 3-1/2" OD tricone roller bit to 250 ft

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2009_04_22.GDT 8/27/08

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
								98.5 - 106.0 ft: smooth drilling, gray drilling fluid (continued)
107.5	107.5 - 111.0 ft: SILTY SAND, fine grained sand, wet, greenish gray, estimated 5 - 10% shells, homogenous structure, strong cementation, moderate to highly weathered shells, weak HCl reaction (with shells), strong HCl reaction (with soil); contains hair like object, possibly organic in nature	SM	-2.5			S-1, SPT 6+7+10 REC=18", 100%		107.5 ft: rig chatter
111.0	111.0 - 115.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray and olive, estimated 5 - 10% shells, homogenous structure, weak cementation, moderately weathered shells, strong HCl reaction (with shells), weak HCl reaction (with soil); shells increase with depth	SP-SM	-6.0			S-2, SPT 50/5" REC=7", 39%		109.0 - 111.0 ft: hard drilling
115.5	115.5 - 120.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated 5 - 10%, homogenous structure, fresh shells, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-10.5			S-3, SPT 11+15+33 REC=18", 100%		111.0 - 113.5 ft: moderate drilling resistance
120.5	120.5 - 123.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, olive gray, estimated 5 - 10% shells, homogenous structure, fresh shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-15.5			S-4, SPT 12+16+30 REC=18", 100%		113.5 - 116.0 ft: slight rig chatter
123.0	123.0 - 127.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, brownish gray, estimated <5% shell fragments, homogenous structure, moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-18.0			S-5, SPT 8+8+16 REC=18", 100%		116.0 - 118.5 ft: smooth drilling
127.5	127.5 - 137.0 ft: SILTY SAND, fine	SM	-22.5			S-6, SPT 5+5+10 REC=18", 100%		118.5 - 121.0 ft: fine grained sand and fine shell fragments in cuttings; marsh funnel test performed on drilling fluid = 67 sec drilling fluid
						S-7, SPT 6+7+21 REC=18", 100%		
						S-8, SPT 5+6+9 REC=18", 100%		123.5 - 125.0 ft: last sample of continuous sampling 123.5 - 128.5 ft: silt and fine shell fragments in cuttings

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
	grained sand, wet, dark gray, estimated <5% shells, weak HCl reaction, highly weathered shells				S-9, SPT 6+9+11 REC=18", 100%		128.5 - 133.5 ft: smooth drilling
		SM					
	133.5 ft: Changes to fresh shells, weak HCl reaction (with shells), no HCl reaction (with soil)				S-10, SPT 4+6+8 REC=18", 100%		133.5 - 138.5 ft: light gray drilling fluid, fine grained sand in cuttings
		SM					
137.0	137.0 - 142.0 ft: SILTY SAND, fine grained sand, wet, olive gray, estimated 5 - 10% shell fragments, no HCl reaction, homogenous structure, moderately weathered shell fragments		-32.0		S-11, SPT 4+4+6 REC=18", 100%		138.5 - 143.5 ft: fast and easy drilling, gray drilling fluid
		SM					
142.0	142.0 - 147.5 ft: SILTY SAND, fine grained sand, wet, brownish gray, estimated 5 - 10% shell fragments, homogenous structure, fresh shells, weak HCl reaction (with shells), strong HCl reaction (with soil), shells decrease and then increase with depth		-37.0		S-12, SPT 4+7+4 REC=18", 100%		143.5 - 148.5 ft: easy drilling, fine shells and silt in cuttings
		SM					
147.5	147.5 - 157.0 ft: SANDY SILT, fine grained sand, wet, olive gray, estimated <5% shells, weak HCl reaction, hard, homogenous structure, moderately weathered shells		-42.5		S-13, SPT 4+8+8 REC=18", 100%		148.5 - 153.5 ft: moderately hard drilling, silt, fine sands and fine shell fragments in cuttings
		ML					
	153.0 ft: Changes to estimated <5% shell fragments, highly weathered shell fragments, no HCl reaction (with shells), weak HCl reaction (with soil)				S-14, SPT 5+7+9 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
157.0	157.0 - 167.0 ft: SANDY SILT, fine grained sand, wet, brownish gray, estimated <5% shell fragments, firm, homogenous structure, fresh to moderately weathered shell fragments, no HCl reaction (with shells), weak HCl reaction (with soil)	ML	-52.0		S-15, SPT 4+5+7 REC=17", 94%		158.5 - 163.5 ft: fine sand, fine shell fragments and silt clumps in cuttings
167.0	167.0 - 177.0 ft: SANDY ELASTIC SILT, fine grained sand, wet, brownish gray, estimated <5% shell fragments, no HCl reaction, hard, homogenous structure	ML	-62.0		S-16, SPT 5+7+7 REC=0", 0%		163.5 - 165.0 ft: no recovery possibly due to insufficient suction in spoon to pull soil up 165.0 ft: drillers cleaned out tub and added 1/2 of a bag of bentonite to 150 gallons clean water
173.5	Changes to olive gray, weak HCl reaction, firm	MH			S-17, SPT 5+6+9 REC=16", 89%		171.0 ft: slower drilling
177.0	177.0 - 181.0 ft: SILTY SAND, fine grained sand, wet, gray, estimated <5% shell fragments, weak HCl reaction, homogenous structure	SM	-72.0		S-18, SPT 5+7+9 REC=18", 100%		
181.0	181.0 - 187.5 ft: SANDY SILT, fine grained sand, wet, olive gray,	ML	-76.0		S-19, SPT 4+7+9		181.0 ft: harder drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	estimated <5% shell fragments, weak HCl reaction, firm, homogenous structure	ML			S-20, SPT 4+7+8 REC=18", 100%		183.5 - 188.5 ft: hard drilling
187.5	187.5 - 192.5 ft: SANDY ELASTIC SILT, fine grained sand, wet, olive gray, estimated <5% shell fragments, weak HCl reaction, hard to firm, homogenous structure, soil softens from hard to firm with depth	MH	-82.5		S-21, SPT 6+9+12 REC=18", 100%		
192.5	192.5 - 207.0 ft: CLAYEY SAND, fine grained sand, wet, olive gray, estimated <5% mica, no HCl reaction, homogenous structure	SC	-87.5		S-22, SPT 6+8+9 REC=18", 100%		193.5 - 198.5 ft: uniform drilling
	198.5 ft: Changes to brownish gray, weak HCl reaction				S-23, SPT 6+8+11 REC=4", 22%		198.5 - 203.5 ft: fine sand and fine sand size shell fragments in cuttings
	203.5 ft: Changes to olive gray, estimated <5% shells, no mica, no HCl reaction, homogenous structure				S-24, SPT 5+8+10 REC=18", 100%		203.5 - 208.5 ft: fine sand and fine shell fragments in cuttings
207.0	207.0 - 212.5 ft: SILTY SAND, fine grained sand, wet, brownish gray, estimated 5 - 10% shell fragments, weak HCl reaction, homogenous	SM	-102.0				207.0 ft: easier drilling

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-357A**
Schnabel No.: 06120048
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DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	structure, moderately weathered shell fragments, shells increase with depth	SM			210	S-25, SPT 4+5+12 REC=18", 100%		208.5 - 213.5 ft: uniform drilling resistance (continued)
212.5	212.5 - 214.6 ft: SILTY SAND, fine grained sand, wet, olive gray, estimated <5% shell fragments	SM	-107.5					
214.6	214.6 - 217.5 ft: SANDY SILT, fine grained sand, wet, olive gray, estimated <5% shell fragments, weak HCl reaction, very soft, homogenous structure	ML	-109.6		215	S-26, SPT 7+14+15 REC=18", 100%		213.5 - 214.6 ft: jar labeled as S-26A 213.5 - 218.5 ft: easier drilling 214.6 - 215.0 ft: jar labeled as S-26B
217.5	217.5 - 222.0 ft: SILTY SAND, fine grained sand, wet, olive gray, weak HCl reaction, homogenous structure, fine fraction is possibly elastic silt; has some cohesion	SM	-112.5		220	S-27, SPT 4+6+12 REC=18", 100%		218.5 - 223.5 ft: silt clumps, fine sand and fine shell fragments in cuttings, driller added water to tub 218.5 - 220.0 ft: performed Hammer Energy Test
222.0	222.0 - 227.5 ft: SILTY SAND, fine grained sand, wet, olive gray, estimated <5% shell fragments, no HCl reaction, homogenous structure, highly weathered shell fragments	SM	-117.0		225	S-28, SPT 5+7+11		223.5 - 228.5 ft: easy drilling
227.5	227.5 - 232.0 ft: SILTY SAND, fine grained sand, wet, olive gray, weak HCl reaction, homogenous structure	SM	-122.5		230	S-29, SPT 5+7+10 REC=18", 100%		
232.0	232.0 - 242.5 ft: SILTY SAND, fine grained sand, wet, brownish gray, estimated <5% shell fragments, homogenous structure, fresh to moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-127.0		235	S-30, SPT 5+7+8 REC=18", 100%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
237.0	Changes to olive gray, no HCl reaction	SM						233.5 - 238.5 ft: increase in drilling fluid, density relative to drilling earlier in day, possibly associated with an increase in silt in drilling fluid (continued)
242.5	242.5 - 250.0 ft: SANDY ELASTIC SILT, fine grained sand, wet, olive gray, weak HCl reaction, firm, homogenous structure	MH	-137.5		240	S-31, SPT 4+10+11 REC=18", 100%		
					245	S-32, SPT 6+8+10 REC=18", 100%		243.5 - 248.5 ft: drillers flushed drilling fluid out of hole using water in preparation of grouting boring cavity following last sampling interval
250.0	247.0 ft: Changes to estimated <5% shell fragments, no HCl reaction, highly weathered shell fragments		-145.0		250	S-33, SPT 6+8+12 REC=18", 100%		

Bottom of Boring at 250.0 ft.

NOTE: Please refer to original field log for end of day groundwater observation depths

Boring backfilled by means of tremie pipe with cement/bentonite grout up to a depth of 100 ft. While pulling casing, base of rig pulled off of truck bed.

Additional Remarks

8.5 - 98.5 ft: advanced 5" OD casing using 140 lbs auto hammer. At 25 ft inside the casing, driller began to advance 4 3/4" OD tricone roller bit (to clean out the plug they got while driving the casing); the roller bit got clogged at 30.5 ft with clay; driller cleaned off the bit and continued cleaning the casing to a depth of 63.5 ft, lost mud/drilling fluid at 63.5 ft. Continued to advance 5" OD casing to 64 ft. Driller cleaned out casing using 4 3/4" OD tricone roller bit to a depth of 73.35 ft, lost drilling fluid at 73.5 ft (~ 50 gallons), driller advanced 5" OD casing to a depth of 74 ft.

74 - 79 ft: Driller emptied 150 gallons of mud tub and filled the tub with 150 gallons of clean water. While lowering 4 3/4" OD tricone roller bit, bit got clogged with clay, driller cleaned bit and rods. Driller advanced 4 3/4" OD tricone roller bit to a depth of 78.5 ft, advanced 5" OD casing to a depth of 79 ft. Schnabel personnel switched from K. Bell to P. Patrick.

79 - 85 ft: Driller advanced 3 3/4" OD tricone roller bit to a depth of 83.5 ft. Driller advanced 5" OD casing to a depth of 84 ft. Driller advanced 4 3/4" OD tricone roller bit to a depth of 88.5 ft. Grinding at 85 ft (smooth drilling).

85 - 93.5 ft: Driller advanced 5" OD casing to a depth of 89 ft. Driller introduced clean water into hole via hose connected to water tank in order to more clearly see if mud is being lost. Driller advanced 4 3/4" OD tricone roller bit to a depth of 93.5 ft. Lost water in hole. Driller added one bag of bentonite into tub, drilling mud is gray. Driller added an additional bag of bentonite to 150 gal tub.

93.5 ft: Driller advanced 5" OD casing to a depth of 94 ft. Drillers advanced 4 3/4" OD tricone roller bit to a depth of 98.5. Marsh funnel test performed on mud = 58 sec drilling fluid. Drillers advanced 5" OD casing to a depth of 99 ft. Changed drill bit from 4 3/4" OD tricone roller bit to 3 1/2" OD tricone roller bit.

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-771
Schnabel No.: 06120048
Sheet: 1 of 5

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-cone Roller Bit,
6" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/24/08 **Finished:** 7/28/08

Easting: 960931.9 ft **Northing:** 219268.2 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 10.6 (ft) **Total Depth:** 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/24	9:02 AM	7.5'	7.5'	---
Start of Day	7/25	7:30 AM	5.5'	14.5'	---
Start of Day	7/28	8:20 AM	8.0'	14.5'	---
Completion	7/28	11:24 AM	2.7'	14.5'	100.0'

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.0 - 2.0	FILL, sampled as sandy lean clay with gravel, fine to medium grained sand, moist, brown, estimated 15 - 25% crushed stone, no HCl reaction	FILL	8.6			S-1, SPT 3+4+7 REC=11", 61%		0.0 ft: Advanced 6 1/4" ID HSA to 14.5 ft. At 0.0 to 2.5 ft interval: rig chatter from 0.3 to 2.0 ft, brown cuttings.
2.0 - 4.5	FILL, sampled as poorly graded sand, medium to coarse grained sand, subangular particles, moist, orangish red and orangish brown, contains a 2 inch layer of silty sand, fine sand, moist, dark gray, est < 5% coarse sand size fresh shell fragments at 3.8 ft, strong HCl reaction (with shells), no HCl reaction (with soil)	FILL	6.1			S-2, SPT 1+6+7 REC=11", 61%		Changes as noted below. See end of boring log for additional remarks
4.5 - 7.0	FILL, sampled as silty sand, medium grained sand, subangular particles, moist, orangish brown, estimated <5% crushed stone, no HCl reaction, lensed, 1 inch pockets of lean clay, light gray, moist	FILL	3.6			S-3, SPT 5+7+7 REC=17", 94%		3.0 - 3.3 ft: Rig chatter
7.0 - 8.8	SILTY SAND, medium grained sand, rounded particles, wet, orangish brown with bands of light gray, no HCl reaction	SM	1.8			S-4, SPT 1/12+1" REC=9", 50%		5.0 - 7.5 ft: Uniform drilling resistance, smooth drilling
8.8 - 9.5	SANDY LEAN CLAY, medium grained sand, rounded particles, wet, light gray, no HCl reaction, soft	CL	1.1					7.5 - 10.0 ft: light brown cuttings
9.5 - 12.5	SANDY LEAN CLAY, medium grained sand, rounded particles, wet, light gray, no HCl reaction, soft	SM	-1.9			S-5, SPT 1/12+2" REC=5", 28%		7.5 - 8.8 ft: Jar labeled as S-4A
12.5 - 17.5	POORLY GRADED SAND WITH SILT, fine to medium grained sand, rounded particles, wet, gray, estimated 15 - 25% shell fragments, coarse sand to fine gravel size fresh to moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-6.9			S-6, SPT 4+4+2 REC=14", 78%		8.8 - 9.0 ft: Jar labeled as S-4B
17.5 - 22.0	POORLY GRADED SAND, fine to medium grained sand, subrounded particles, wet, dark gray, estimated <5% shell fragments, coarse sand to fine gravel size fresh to highly weathered shell fragments, weak HCl	SP				S-7, SPT 4+4+7 REC=15", 83%		14.5 ft: Switch to 3 1/2" OD tricone roller bit (mud rotary) and advanced to 23.5 ft, mix one bag of bentonite with 125 gallons of water to make drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
22.0	reaction (with shells), no HCl reaction (with soil)	SP	-11.4				fluid.
22.0 - 27.0	POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM			S-8, SPT 3+9+12 REC=18", 100%		23.5 - 28.5 ft: switched to 6" OD tricone bit and reamed to 28.5 ft, greenish gray fluid during reaming
27.0	27.0 - 31.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated 5 - 10% fine gravel, estimated 5 - 10% shell fragments, fine gravel as cemented sands, coarse sand to fine gravel size fresh to highly weathered shell fragments, strong HCl reaction (with shells and soil), moderate to strong cementation	SM	-16.4		S-9, SPT 6+32+50 REC=18", 100%		28.5 ft: Advanced 6"OD tricone bit to 100 ft. 28.5 to 33.5 ft interval difficult drilling from 29 ft 30.5 ft, olive gray fluid, thinned fluid by adding water
31.0	31.0 - 37.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction	SM	-20.4		UD-1, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	31.5 - 33.5 ft: pushed pitcher sampler: 24" , 24" recovery
31.0 - 37.0					S-10, SPT 3+6+11 REC=18", 100%		33.5 - 38.5 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid
37.0	37.0 - 41.0 ft: SILT, moist, olive gray, contains mica, estimated <5% shell fragments, firm, coarse sand size highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	ML	-26.4		S-11, SPT 6+9+9 REC=18", 100%		
41.0	41.0 - 43.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction	SM	-30.4		UD-2, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	41.5 - 43.5 ft: pushed pitcher sampler: 24" , 24" recovery
43.5	43.5 - 47.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand size moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-32.9		S-12, SPT 5+7+11 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
47.0	47.0 - 51.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated 5 - 10% shell fragments, coarse sand to fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-36.4					
					50	S-13, SPT 6+5+10 REC=18", 100%		
51.5	51.5 - 53.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, contains shell fragments, weak HCl reaction, highly weathered shell fragments	SP-SM	-40.9				PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	51.5 - 53.5 ft: pushed pitcher sampler: 24", 24" recovery
53.5	53.5 - 57.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand size highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-42.9					
					55	S-14, SPT 5+7+10 REC=18", 100%		
57.0	57.0 - 61.0 ft: SILT, moist, olive gray, contains mica, strong HCl reaction, firm	ML	-46.4					
					60	S-15, SPT 8+8+11 REC=18", 100%		58.5 - 61.5 ft: thinned drilling fluid by adding water
61.0	61.0 - 67.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, contains shell fragments, weak HCl reaction, coarse sand size, highly weathered shell fragments	SM	-50.4				PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	61.5 ft: flushed boring to remove settled cuttings 61.5 - 63.5 ft: pushed pitcher sampler: 24", 24" recovery
	63.5 ft: Changes to estimated <5% shell fragments, coarse sand size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM						
					65	S-16, SPT 5+8+10 REC=18", 100%		
67.0	67.0 - 81.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm	ML	-56.4					
					70	S-17, SPT 5+7+9 REC=18", 100%		68.5 - 71.5 ft: thinned drilling fluid by adding water
							PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	71.5 - 73.5 ft: pushed pitcher sampler: 24", 24" recovery
						UD-5, UNDIST REC=24", 100%		
						S-18, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
75					7+9+11	REC=18", 100%		
80					S-19, SPT 8+8+11	REC=18", 100%		
81.0	81.0 - 91.0 ft: SILT, moist, olive gray, contains mica, weak HCl reaction, firm	ML	-70.4		UD-6, UNDIST REC=24", 100%		PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	81.5 - 83.5 ft: pushed pitcher sampler: 24", 24" recovery
85		ML			S-20, SPT 9+10+11	REC=18", 100%		
90					S-21, SPT 7+9+11	REC=18", 100%		
91.0	91.0 - 100.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm	ML	-80.4		UD-7, UNDIST REC=24", 100%		PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	91.5 - 93.5 ft: pushed pitcher sampler: 24", 24" recovery
95		ML			S-22, SPT 8+10+12	REC=18", 100%		
100.0			-89.4		S-23, SPT 9+10+12	REC=18", 100%		

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-771**
Schnabel No.: 06120048
Sheet: 5 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	Bottom of Boring at 100.0 ft. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.							
	<u>Additional Remarks</u> 71.5 - 78.5 ft: Cuttings contain silt and coarse sand sized shell fragments 78.5 - 81.5 ft: Cuttings contain coarse sand sized shell fragments, thinned drilling fluid by adding water and removing cuttings from mud tub, pumped out all fluid in mud tub, mixed one bag of bentonite with 125 gallons of water to make new mud, circulated mud through boring to clear cuttings Please refer to original field log for End of Day groundwater observation depths							

DRAFT



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-772**
Schnabel No.: 06120048
Sheet: 1 of 5

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: T. Chew
Schnabel Representative: B. Glass
Equipment: Diedrich D-50 (Track ATV); AWJ Rods
Method: 6-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-cone Roller Bit,
6" O.D. Tri-cone Roller Bit
Hammer Type: Auto Hammer (140 lb)
Dates Started: 7/29/08 **Finished:** 7/30/08
Easting: 960876.1 ft **Northing:** 219323.9 ft **By:** Land Survey
Coordinate System: MD State Plane
Ground Surface Elevation: 10.6 (ft) **Total Depth:** 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/29	8:38 AM	7.5'	7.5'	---
Start of Day	7/30	8:00 AM	4.0'	24.0'	---
Completion	7/30	10:00 AM	3.2'	24.0'	53.7'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.2	0.0 - 0.2 ft: Topsoil, organics, grass	FILL	10.4			S-1, SPT 2+4+5 REC=12", 67%		0.0 ft: Advanced 6 1/4" ID HSA to to 9.0 ft. at 0.0 to 2.5 ft interval bit chatter/auger grinding from 0.0 to 5 ft, brown cuttings, changes as noted below, see end of boring log for additional remarks. 2.5 ft: Uniform drilling resistance, smooth drilling
2.0	0.2 - 2.0 ft: FILL, sampled as sandy lean clay, fine to medium grained sand, subangular particles, moist, brown, estimated 5 - 10% crushed stone, no HCl reaction		8.6			S-2, SPT 5+14+19 REC=15", 83%		
	2.0 - 7.0 ft: FILL, sampled as silty sand, medium to coarse grained sand, subangular particles, moist, orangish brown, estimated <5% fine gravel, estimated <5% crushed stone, no HCl reaction				5	S-3, SPT 4+8+7 REC=15", 83%		
7.0	7.0 - 12.5 ft: SILTY SAND, medium to coarse grained sand, subangular particles, wet, orangish brown, no HCl reaction, contains a 2 inch layer of SANDY LEAN CLAY (CL), medium sand, moist brown at 8.1 ft	SM	3.6			S-4, SPT woh+1+1 REC=16", 89%		7.5 - 9.0 ft: orangish brown cuttings 9.0 ft: switched to 3 1/2" OD tricone roller bit (mud rotary) and advanced to 38.5 ft, mixed one bag of bentonite with 125 gallons of water for drilling fluid 9.0 ft: uniform drilling resistance, smooth drilling, brown drilling fluid 13.5 - 18.5 ft: brownish gray fluid
	10.0 ft: Changes to medium grained sand, subrounded particles, estimated <5% fine gravel				10	S-5, SPT 1+2+1 REC=11", 61%		
12.5	12.5 - 17.0 ft: SILTY SAND, medium grained sand, wet, gray, estimated 5 - 10% fine gravel, estimated <5% shell fragments, strong HCl reaction, moderate cementation, coarse sand to fine gravel size moderately to highly weathered shell fragments, fine gravel as cemented sand	SM	-1.9			S-6, SPT 9+10+11 REC=18", 100%		
17.0	17.0 - 22.5 ft: POORLY GRADED SAND, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, coarse sand to fine gravel size, highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP	-6.4			S-7, SPT 2+6+9 REC=11", 61%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
22.5	22.5 - 27.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, estimated <5% fine gravel, estimated <5% shell fragments, strong HCl reaction, fine gravel as cemented sands, fine gravel size highly weathered shell fragments, weak to moderate cementation	SP	-11.9		S-8, SPT 8+10+16		18.5 - 23.5 ft: drilling fluid cuttings contain coarse sand sized cemented sands (continued)
27.0	27.0 - 32.5 ft: SILTY SAND, fine grained sand, moist, dark gray, estimated <5% fine gravel, estimated <5% shell fragments, strong HCl reaction, fine gravel as cemented sands, coarse sand to fine gravel sized fresh to highly weathered shell fragments, moderate to strong cementation	SP-SM	-16.4		S-9, SPT 25+50/3" REC=8", 83%		28.5 - 33.5 ft: Uniform drilling, smooth drilling despite high blow counts, drilling fluid cuttings contain coarse sand sized cemented sands and coarse sand size fresh shell fragments
32.5	32.5 - 37.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, no HCl reaction	SP-SM	-21.9		S-10, SPT 4+6+8 REC=18", 100%		33.5 - 38.5 ft: olive gray fluid, drilling fluid cuttings contain coarse sized fresh shell fragments
37.0	37.0 - 41.5 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm	ML	-26.4		S-11, SPT 7+8+9 REC=18", 100%		38.5 ft: switched to 6" O.D. tricone roller bit and advanced to 58.5 ft, reamed hole
41.5	41.5 - 43.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, no HCl reaction	SM	-30.9		UD-1, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	41.5 - 43.5 ft: pushed pitcher sampler 24", 24 recovery
43.5	43.5 - 56.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size moderately weathered shell fragment, strong HCl reaction (with shells), weak HCl reaction (with soil), contains 0.25 inch of organics (wood) at 44.4 ft	SM	-32.9		S-12, SPT 4+8+11 REC=18", 100%		41.5 ft: Advanced 6" OD tricone bit: uniform drilling resistance, smooth drilling, olive gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
48.5	Changes to estimated 5 - 10% shell fragments, fresh to moderately weathered shell fragments					S-13, SPT 7+8+12 REC=18", 100%		48.5 ft: removed cuttings from mud tub, added 75 gallons of water and half a bag of bentonite to make drilling fluid
51.5	Changes to estimated <5% shell fragments, moderately weathered shell fragments, strong HCl reaction (with shells and soil)	SM				UD-2, UNDIST REC=13.5", 56%		51.5 - 53.5 ft: pushed pitcher sampler 24", 13.5" recovery, sample placed in jar and labeled as UD-2
53.5	Changes to estimated 5 - 10% shell fragments, contains a 1.5 inch layer of POORLY GRADED SAND (SP) fine to medium sand at 52.6 ft, coarse sand to fine gravel size fresh to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)					S-14, SPT 4+8+12 REC=18", 100%		
56.0	56.0 - 58.5 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm	ML	-45.4			UD-3, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	56.5 - 58.5 ft: pushed pitcher sampler 24", 24" recovery
58.5	58.5 - 62.5 ft: SILT WITH SAND, fine grained sand, moist, olive gray, contains mica, strong HCl reaction, firm	ML	-47.9			S-15, SPT 9+10+11 REC=18", 100%		56.5 ft: switched to 3-1/2" OD tricone roller bit and advanced to 100 ft, 56.6 to 63.5 interval, uniform drilling resistance, smooth drilling, olive gray drilling fluid
62.5	62.5 - 67.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-51.9			S-16, SPT 6+7+11 REC=18", 100%		
67.5	67.5 - 77.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction	SM	-56.9			S-17, SPT 8+10+12 REC=18", 100%		68.5 - 70.0 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid
						S-18, SPT		

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-772
Schnabel No.: 06120048
Sheet: 4 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
		SM			75	5+6+8 REC=18", 100%		73.5 ft: Circulate drilling fluid to remove cuttings that settled overnight
77.0	77.0 - 87.0 ft: SILT, moist, olive gray, contains mica, strong HCl reaction, firm		-66.4		80	S-19, SPT 7+8+9 REC=18", 100%		
	83.5 ft: Changes to weak HCl reaction	ML			85	S-20, SPT 9+10+14 REC=18", 100%		83.5 - 85.0 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid
87.0	87.0 - 100.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm		-76.4		90	S-21, SPT 7+8+9 REC=18", 100%		
		ML			95	S-22, SPT 8+10+11 REC=18", 100%		93.5 - 98.5 ft: thinned drilling fluid by adding water
	98.5 ft: Changes to strong HCl reaction					S-23, SPT 9+10+12 REC=18", 100%		
100.0			-89.4		100			

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-772**
Schnabel No.: 06120048
Sheet: 5 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		

Bottom of Boring at 100.0 ft.

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

NOTE: Negative groundwater depth denotes water level above ground surface (i.e. "negative depth"), but does not necessarily imply artesian conditions.

Additional Remarks

41.5 ft: Attempt to lower pitcher sampler, but rods got hung up at about 11.0 ft, attempt to clear augers with 6" OD tricone bit with no success, advanced 6 1/4" ID HSA to 24 ft to case off the zone where the pitcher sampler was getting hung up, thinned drilling fluid by adding water, reamed boring with 6" OD tricone bit to 41.5 ft Please refer to original field log for End of Day groundwater observation depths.

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TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-773**
Schnabel No.: 06120048
Sheet: 1 of 9

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: M. Lark
Schnabel Representative: W. Bradfield
Equipment: Diedrich D-50 (Track ATV); AWJ Rods
Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/24/08 **Finished:** 7/30/08

Easting: 961045.9 ft **Northing:** 219241.3 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 7.9 (ft) **Total Depth:** 165.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/24	7:00 AM	5.0'	4.0'	---
Start of Day	7/28	8:20 AM	6.5'	9.0'	---
Start of Day	7/29	7:20 AM	0.4'	9.0'	---
Completion	7/30	8:45 AM	8.4'	9.0'	---

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.3	0.0 - 0.3 ft: Rootmat and topsoil		7.6			S-1, SPT 2+7+8 REC=8", 44%		0.0 - 2.5 ft: advanced 4 1/4" ID HSA to 9 ft
2.0	0.3 - 2.0 ft: FILL, sampled as clayey sand with gravel, fine to coarse grained sand, subrounded to subangular particles, moist, orangish brown with light brownish yellow, estimated 15 - 25% crushed stone, estimated <5% roots, no HCl reaction, coarse sand crumble, fine gravel fracture	FILL	5.9			S-2, SPT 2+3+5 REC=15.5", 86%		0.0 - 2.5 ft: uniform drilling resistance, smooth drilling, minor grinding on fine gravel, orangish brown cuttings; changes as noted below. see end of boring log for additional remarks.
4.5	2.0 - 4.5 ft: PROBABLE FILL, sampled as clayey sand, fine to medium grained sand, moist, light brownish yellow with bands of light orangish brown, estimated <5% grass, rounded fine gravel, alternating colors from 0.13 - 0.5 ft, with 0.13 - 0.5 inch thick layer of sandy clay, fine sand, moist, light gray, stratified	FILL	3.4		5	S-3, SPT 1+1+1 REC=18", 100%		2.5 - 5.0 ft: light brown cuttings
7.0	4.5 - 7.0 ft: PROBABLE FILL, sampled as clayey sand, fine to medium grained sand, wet, light gray, no HCl reaction, stratified 0.5 inch with bands of light brownish yellow and light orangish colors	FILL	0.9			S-4, SPT WOH+18 REC=15", 83%		5.0 - 7.5 ft: driller advanced in 1st gear to maintain borehole integrity, light yellowish brown cuttings
9.5	7.0 - 9.5 ft: PROBABLE FILL, sampled as clayey sand, fine to medium grained sand, wet, light yellowish brown with mottles of light orangish brown, no HCl reaction, light gray, sandy lean clay pockets 0.25 - 0.5 inch thick	FILL	-1.6		10	S-5, SPT WOH+1+12 REC=9", 50%		7.5 - 9.0 ft: light brownish gray cuttings
11.2	9.5 - 11.2 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, subrounded particles, wet, gray, no HCl reaction, homogenous structure, coarse sand crumbles	SP-SM	-3.3			S-6, SPT 5+17+27 REC=13", 72%		9.0 ft: pulled out 4 1/4" ID HSA, installed 6" ID PVC casing into borehole and grouted annulus
12.0	11.2 - 12.0 ft: SILTY SAND, fine to coarse grained sand, angular to subrounded particles, wet, light gray with streaks of white, estimated 15 - 25% cemented sands, estimated 5 - 10% shell fragments, no HCl reaction, medium to coarse sand sized, moderate to highly weathered shell fragments, with fine gravel and some medium to coarse sand cemented sands or shells	SM	-4.1					9.0 ft: switched to 3 1/2" OD tricone roller bit (mud rotary) and advanced to 165 ft, mud mix: 50lbs bentonite powder to 100 gallons of water
	12.0 - 15.9 ft: SILTY SAND, fine to coarse grained sand, angular to	SM						9.0 - 10.0 ft: uniform drilling resistance, smooth drilling, light gray drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
15.9	subangular particles, light gray with streaks of white, estimated 30 - 45% shell fragments, estimated 30 - 45% cemented sands, angular fine gravel, medium to coarse sand and fine gravel size fresh to highly weathered shell fragments, coarse to fine gravel size cemented sand, strong HCl reaction (with shells), no HCl reaction (with soil), strong HCl reaction (with cemented sands), moderate to strong cementation 15.0 ft: Changes to contains fine to coarse gravel	SM	-8.0			S-7, SPT 15+6+6 REC=16", 89%		10.0 - 11.2 ft: jar labeled as S-5A 11.2 - 11.5 ft: jar labeled as S-5B 11.5 ft: harder drilling with slight rig chatter, light brownish gray drilling fluid 11.8 ft: softer drilling, uniform drilling resistance 12.5 - 15.0 ft: intermittent hard and soft drilling with rig chatter light gray drilling fluid
19.5	15.9 - 19.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray with streaks of white, estimated 5 - 10% shell fragments, medium to coarse sand size highly weathered to fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil) 19.5 - 24.5 ft: SILTY SAND, fine to medium grained sand, moist, gray with streaks of white, estimated 5 - 10% shell fragments, estimated 5 - 10% cemented sands, weak cementation, moderate to highly weathered shell fragments, fine gravel sized cemented sands, strong HCl reaction (with shells), weak HCl reaction (with soil and cemented sands)	SP-SM	-11.6		20	S-8, SPT 5+12+19 REC=18", 100%		15.0 - 15.9 ft: jar labeled as S-7A 15.0 - 19.0 ft: uniform resistance, smooth drilling 15.9 - 16.5 ft: jar labeled as S-7B 19.5 - 20.0 ft: slightly harder drilling with rig chatter 20.0 - 25.0 ft: uniform drilling resistance, smooth drilling
24.5	24.5 - 29.0 ft: CLAYEY SAND, fine to medium grained sand, moist, gray with streaks of white, estimated 5 - 10% shell fragments, estimated <5% cemented sands, weak cementation, moderate to highly weathered shell fragments, coarse sand to fine gravel sized cemented sands, strong HCl reaction (with shells and cemented sands), weak HCl reaction (with soil) 25.8 ft: Changes to estimated 30 - 45% shell fragments	SC	-16.6		25	S-9, SPT 2+4+12 REC=18", 100%		26.8 - 27.4 ft: slightly harder drilling with rig chatter
29.0	29.0 - 34.0 ft: SILTY SAND, fine grained sand, moist, dark grayish green with speckles of light brownish white, estimated <5% shell fragments, coarse sand to fine gravel sized highly weathered to fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SM	-21.1		30	S-10, SPT 3+4+6 REC=16.5", 92%		30.0 - 35.0 ft: smooth drilling, uniform drilling resistance
34.0	34.0 - 38.5 ft: SANDY SILT, fine to medium grained sand, moist, grayish green, weak HCl reaction, firm, homogenous structure	ML	-26.1		35			

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
		ML				S-11, SPT 4+6+8 REC=18", 100%		35.0 - 40.0 ft: gray drilling fluid (continued)
38.5	38.5 - 44.0 ft: SILTY SAND, fine to medium grained sand, moist, grayish green with speckles of light brownish white, estimated <5% shell fragments, homogenous structure, medium to coarse sand sized fresh to moderately weathered shells, strong HCl reaction (with shells), no HCl reaction (with soil)	SM	-30.6		40	S-12, SPT 3+4+6 REC=18", 100%		
44.0	44.0 - 49.0 ft: SILTY SAND, fine to medium grained sand, wet, grayish green with speckles of white, estimated 5 - 10% shell fragments, contains mica, medium sand to fine gravel sized shell fragments, fresh to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-36.1		45	S-13, SPT 2+2+3 REC=17", 94%		45.0 - 50.0 ft: light grayish green drilling fluid
49.0	49.0 - 54.0 ft: SILTY SAND, fine grained sand, moist, olive gray with streaks of white, estimated <5% shell fragments, moderately to highly weathered shell fragments, strong HCl reaction (with shells), weak to strong HCl reaction (with soil)	SM	-41.1		50	S-14, SPT 3+4+6 REC=18", 100%		
54.0	54.0 - 59.0 ft: SILTY SAND, fine grained sand, moist, olive gray with speckles of white, estimated <5% shell fragments, contains mica, highly weathered shell fragments, strong HCl	SM	-46.1		55	S-15, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	reaction (with shells), weak to strong HCl reaction (with soil)	SM			4+5+7	REC=18", 100%		
59.0	59.0 - 74.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, homogenous structure		-51.1		60	S-16, SPT 4+4+6 REC=18", 100%		60.0 - 65.0 ft: clumps of fine silty sand, fine to medium sand and medium sand sized shell fragments
	60.9 ft: Changes to with streaks of white, estimated <5% shell fragments, highly weathered shell fragments, strong HCl reaction (with shells)				65	S-17, SPT 3+4+5 REC=18", 100%		
	65.0 ft: Changes to fine grained sand, moist, olive gray, contains mica, weak HCl reaction, homogenous structure	SM			70	S-18, SPT 3+4+6 REC=18", 111%		
74.0	74.0 - 94.0 ft: SANDY ELASTIC SILT, fine grained sand, moist, grayish green, contains mica, strong HCl reaction, hard, homogenous structure	MH	-66.1		75	S-19, SPT 4+6+7		

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-773
Schnabel No.: 06120048
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DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
						REC=18", 100%		75.0 - 80.0 ft: greenish gray drilling fluid, cuttings consist of clumps of fine sandy silty /silty sand, fine to medium sand and few medium sand sized shell fragments (continued)
	80.0 ft: Changes to weak HCl reaction				80	S-20, SPT 4+7+8 REC=18", 100%		
					85	S-21, SPT 4+5+7 REC=18", 100%		85.0 - 90.0 ft: cuttings contain large clumps (1-3") of fine sandy silt, fine to medium sand and some medium sand sized shell fragments
					90	S-22, SPT REC=18", 100%		90.0 - 95.0 ft: cuttings contain clumps of fine sandy silt/silty sand, fine to medium sand and medium sand sized shell fragments
94.0	94.0 - 99.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, lensed, with 0.25 - 0.5 inch pockets of FINE SANDY SILT (ML)	SM	-86.1		95	S-23, SPT 7+7+9 REC=18", 100%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
99.0	99.0 - 108.5 ft: SILTY SAND, fine grained sand, moist, olive gray with speckles of white, estimated <5% shell fragments, contains mica, weak HCl reaction, homogenous structure, fine sand sized moderately to highly weathered shell fragments, difficult to differentiate HCl reaction between soil and shell fragments	SM	-91.1		100	S-24, SPT 5+8+11 REC=18", 100%		100.0 - 105.0 ft: cuttings contain fine to medium sand, clumps of fine silty sand/sandy silt and fine to medium sand sized shell fragments
105.0	105.0 ft: Changes to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM			105	S-25, SPT 5+5+7 REC=18", 100%		
108.5	108.5 - 114.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, homogenous structure	SM	-100.6		110	S-26, SPT 5+5+6 REC=18", 100%		111.5 - 113.5 ft: softer drilling, faster penetration rate, greenish gray drilling fluid
114.0	114.0 - 119.0 ft: SILTY SAND, fine to medium grained sand, wet, olive gray with speckles of light brownish white, estimated 5 - 10% shell fragments, lensed, medium sand to fine gravel size moderately weathered to fresh shell fragments, strong HCl reaction	SM	-106.1		115	S-27, SPT 5+3+6 REC=18", 100%		113.5 - 115.0 ft: slightly harder drilling with uniform drilling resistance, smooth drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	(with shells), no HCl reaction (with soil), 0.5 inch pockets of SANDY SILT (ML)	SM						
119.0	119.0 - 138.0 ft: SILTY SAND, fine to medium grained sand, moist, olive gray, contains mica, no HCl reaction, homogenous structure		-111.1		120	S-28, SPT 3+3+7 REC=18", 100%		120.0 - 125.0 ft: cuttings contain fine to medium sand and fine to medium sand sized shell fragments, some < 1" clumps of fine sandy silt
	125.0 ft: Changes to fine grained sand, weak HCl reaction				125	S-29, SPT 3+4+6 REC=18", 100%		125.0 - 130.0 ft: grayish green drilling fluid
		SM			130	S-30, SPT 3+5+8 REC=18", 100%		130.0 - 135.0 ft: greenish gray drilling fluid, cuttings consist of fine to medium sand with minor clumps of fine silty sand/sandy silt, trace amount of fine to medium sand sized shell fragments
	135.0 ft: Changes to no to weak HCl reaction				135	S-31, SPT 3+5+9 REC=18", 100%		135.0 - 140.0 ft: grayish green drilling fluid

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TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-773**
Schnabel No.: 06120048
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DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
165.0		SM	157.1		165			

Bottom of Boring at 165.0 ft.

NOTE: No groundwater measurements taken 7/24 (end of day) or 7/25 (start of day) due to PVC grouting activities.

Upon removal of 4 1/2" I.D. HSA 6" I.D. pvc pipe installed to 9.0 ft as per specification and annular space filled with grout.

Drilling commenced following pvc pipe using 3 1/2" O.D. tricone roller bit to 165.0 ft.

Upon completion of boring, reamed hole with 5" O.D. tricone roller bit to 165.0 ft to meet specification for downhole geophysical logging equipment (with 15 ft of overdrill for "rat-hole" to accommodate geophysical probe.

Performed downhole geophysical logging upon completion of ream.

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-773A
Schnabel No.: 06120048
Sheet: 1 of 6

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Connelly

Schnabel Representative: K. Bell

Equipment: CME-75 (Truck); AWJ

Method: 6-1/4" I.D. Hollow Stem Auger,
6" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 8/7/08 **Finished:** 8/12/08

Easting: 961053 ft **Northing:** 219234 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 8± (ft) **Total Depth:** 150.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
End of Day	8/7	6:15 PM	1.0'	8.5'	---
Start of Day	8/8	7:00 AM	2.0'	8.5'	---
End of Day	8/8	1:45 PM	1.5'	8.5'	---
Start of Day	8/11	9:00 AM	6.0'	8.5'	30.0'
End of Day	8/11	5:15 PM	1.5'	8.5'	---
Start of Day	8/12	7:30 AM	10.0'	8.5'	---
Completion	8/12	2:30 PM	6.0'	8.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
0.0 - 18.0 ft: POORLY GRADED GRAVEL WITH SAND, fine to coarse gravel, angular to subangular particles, wet, light gray, contains shells, hard, fine to coarse sand, subrounded to subangular coarse sand, strong cementation with gravel, strong HCl reaction (with soil)		GP						0.0 ft: see boring log B-773 for accurate lithologic divisions, complete intermediate descriptions and additional remarks; lithologic divisions shown here may not reflect actual boundaries
					5			
					10			
					15	UD-1, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	13.0 - 15.0 ft: pushed pitcher sample 24", 24" recovery 13.0 ft: advanced 6" OD tricone roller bit to 150 ft
18.0	18.0 - 28.0 ft: SILTY SAND, fine to medium grained sand, moist, olive gray, contains shells, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-10.1					

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-773A
Schnabel No.: 06120048
Sheet: 2 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
								13.0 - 23.0 ft: rig chatter from 13 to 18 ft (possible cemented sands), smooth drilling from 18 to 19 ft, rig chatter and hard drilling from 19 to 20 ft (possible cemented sand), smooth drilling from 20 to 23 ft; changes as noted below (continued)
		SM			25	UD-2, UNDIST REC=15.5", 65%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	
28.0	28.0 - 37.0 ft: SANDY SILT, fine grained sand, moist, olive gray and grayish green, contains shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	ML	-20.1		30			23.0 - 25.0 ft: pushed pitcher sample 24", 15.5" recovery 23.0 - 33.0 ft: uniform drilling resistance, smooth drilling harder drilling at 26.5 ft, slight rig chatter at 28 ft (possible shells), smooth drilling 25 ft to 33 ft, light gray drilling fluid
					35	UD-3, UNDIST REC=19", 79%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	33.0 - 35.0 ft: pushed pitcher sample 24", 19" recovery 33.0 - 43.0 ft: uniform drilling resistance, smooth drilling, light gray drilling fluid
37.0	37.0 - 72.0 ft: SILTY SAND, fine to medium grained sand, moist, olive gray, contains shell fragments, weak HCl reaction	SM	-29.1		40			
					45	UD-4, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	43.0 - 45.0 ft: pushed pitcher sample 24", 24" recovery

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-773A
Schnabel No.: 06120048
Sheet: 3 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
					50			43.0 - 53.0 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid, cuttings observed are clumps of silty sand, fine to medium sand (continued)
					55	UD-5, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	53.0 - 55.0 ft: pushed pitcher sample 24", 24" recovery 53.0 - 63.0 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid, cuttings observed are clumps of silty sand, fine to medium sand and shells
		SM			60			
	63.0 ft: Changes to dark olive gray, strong HCl reaction				65	UD-6, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	63.0 - 65.0 ft: pushed pitcher sample 24", 24" recovery 63.0 - 73.0 ft: cuttings observed are silty sand, fine to medium sand
					70			
72.0	72.0 - 92.0 ft: SANDY ELASTIC SILT, fine grained sand, moist, grayish green, contains mica, weak HCl reaction	MH	-64.1			UD-7, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf	

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-773A**
Schnabel No.: 06120048
Sheet: 4 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
75							PP > 4.50 tsf	73.0 - 75.0 ft: pushed pitcher sample 24", 24" recovery (continued)
80								
83.0	Changes to olive green and grayish green	MH				UD-8, UNDIST REC=19", 79%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	83.0 - 85.0 ft: pushed pitcher sample 24", 19" recovery 83.0 - 93.0 ft: olive gray and grayish green drilling fluid, cuttings observed are clumps of silty sand fine sand
85								
90								
92.0	92.0 - 101.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction		-84.1					
		ML				UD-9, UNDIST REC=21", 88%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	93.0 - 95.0 ft: pushed pitcher sample 24", 24" recovery 93.0 - 103.0 ft: smooth and easy drilling, olive gray drilling fluid, sandy silty fine to medium sand cuttings
95								
100								

(continued)

**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-773A**
Schnabel No.: 06120048
Sheet: 5 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
101.0	101.0 - 121.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains shells, contains mica, weak HCl reaction	SM	-93.1					
						UD-10, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	103.0 - 105.0 ft: pushed pitcher sample 24", 24" recovery 103.0 - 113.0 ft: smooth drilling
					105			
					110			
						UD-11, UNDIST REC=22", 92%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	113.0 - 115.0 ft: pushed pitcher sample 24", 22" recovery 113.0 - 123.0 ft: silty sand fine to medium sand cuttings
					115			
					120			
121.0	121.0 - 134.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction	SM	-113.1					
						UD-12, UNDIST REC=23", 96%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	123.0 - 125.0 ft: pushed pitcher sample 24", 23" recovery 123.0 - 136.0 ft: dark olive gray drilling fluid
					125			

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	130.0 ft: Changes to fine to medium grained sand	SM			130			123.0 - 136.0 ft: dark olive gray drilling fluid (continued)
134.0	134.0 - 150.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction		-126.1		135			
						UD-13, UNDIST REC=22", 92%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	136.0 - 138.0 ft: pushed pitcher sample 24", 22" recovery 136.0 - 148.0 ft: olive gray drilling fluid
		ML			140			
					145			
150.0			-142.1		150	UD-14, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	
Bottom of Boring at 150.0 ft. Boring backfilled with cuttings upon completion.								



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-774**
Schnabel No.: 06120048
Sheet: 1 of 8

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: M. Lark

Schnabel Representative: W. Bradfield

Equipment: CME-75 (ATV); AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-cone Roller Bit,
6" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/30/08 Finished: 8/7/08

Easting: 961000.5 ft Northing: 219196 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 10.1 (ft) Total Depth: 150.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/30	2:01 PM	13.0'	11.5'	---
Start of Day	7/31	7:48 AM	6.0'	13.5'	---
Start of Day	8/1	7:25 AM	6.5'	13.5'	---
Start of Day	8/4	9:15 AM	7.5'	13.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.3	0.0 - 0.3 ft: Topsoil		9.8			S-1, SPT 2+7+10 REC=15", 83%		0.0 ft: advanced 6 1/4" ID HSA to 13.5 ft
2.0	0.3 - 2.0 ft: FILL, sampled as clayey sand with gravel, fine to coarse grained sand, angular to subrounded particles, moist, brown with mottles of reddish brown, estimated 5 - 10% crushed stone, no HCl reaction, fine to coarse gravel, rounded to angular gravel, coarse sand crumble, fine to coarse gravel fracture	FILL	8.1			S-2, SPT 6+10+9 REC=13", 72%		0.0 - 2.5 ft: hard drilling significant rig chatter, brown and yellowish cuttings; changes as noted below, see end of boring log for additional remarks
5.0	2.0 - 5.0 ft: FILL, sampled as poorly graded sand with clay, medium grained sand, subangular to rounded particles, moist, yellowish red with mottles of grayish yellow, no HCl reaction, coarse sand fractures	FILL	5.1		5	S-3, SPT 8+9+7 REC=5", 28%		2.5 - 5.0 ft: uniform drilling resistance, smooth drilling, yellowish red cuttings
7.0	5.0 - 7.0 ft: FILL, sampled as clayey sand with gravel, medium to coarse grained sand, rounded to angular particles, moist, reddish brown, no HCl reaction, rounded coarse gravel, coarse sand and gravel fracture, gravel ius quartzite at top of sample	FILL	3.1			S-4, SPT 2+7+9 REC=11", 61%		5.0 - 7.5 ft: very hard drilling, slow penetration rate, significant grinding, reddish brown cuttings
	7.0 - 11.5 ft: FILL, sampled as clayey sand, fine to medium grained sand, moist, light yellowish brown with bands of light gray, no HCl reaction, lensed, clay lense is light gray, 3/4" fine to medium sandy lean clay pocket @ 8.1	FILL				S-5, SPT 1+1+1 REC=9", 50%		7.5 - 10.0 ft: uniform drilling resistance, smooth drilling, light red cuttings
	9.5 ft: Changes to fine to coarse grained sand, rounded particles, light red and light brown, interbeds sandy lean clay interbeds, fine to medium sand, moist, light gray no HCl reaction, very soft (1 to 3 inch thick)				10	UD-1, UNDIST REC=19", 99%	PP = 0.00 tsf PP = 0.00 tsf PP = 0.00 tsf	11.5 - 13.1 ft: pushed shelby tube 19", 19" recovery
11.5	11.5 - 13.4 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, gray with speckles of white, estimated 5 - 10% shell fragments, medium sand size moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-1.4			S-6, SPT 38+50/1.5" REC=7", 97%		11.5 - 13.5 ft: at 13.4 ft, hard drilling with rig chatter
13.4	13.1 ft: Changes to estimated <5% shell fragments	SP-SM	-3.3					13.1 - 13.4 ft: jar labeled as S-6A
14.5	13.4 - 14.5 ft: POORLY GRADED SAND WITH SILT AND GRAVEL, fine	SC	-4.4					13.4 - 13.7 ft: jar labeled as S-6B

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
16.5	to coarse grained sand, angular to subrounded particles, wet, gray and light gray, estimated 50 - 100% cemented sands, estimated 30 - 45% shell fragments, angular fine to coarse gravel, coarse sand to coarse gravel sized cemented sands, medium sand to fine gravel sized moderately weathered shell fragments, strong HCl reaction (with shells and cemented sands), no HCl reaction (with soil), moderate to strong cementation	SC	-6.4			S-7, SPT 7+24+32 REC=14", 78%		13.5 ft: switched to 6" OD tricone roller bit (mud rotary) and advanced to 53.5 ft; 35 lbs powdered bentonite to ~ 100 gals water
20.0	14.5 - 16.5 ft: CLAYEY SAND, fine to coarse grained sand, angular particles, wet, light gray with mottles of dark gray, estimated 30 - 45% cemented sands, estimated 30 - 45% shell fragments, moderate cementation, subangular to angular fine to coarse gravel, coarse sand to coarse gravel as cemented sands, medium to fine gravel sized shell fragments, strong HCl reaction (with cemented shells and sand), no HCl reaction (with soil)	SM	-9.9		20	UD-2, UNDIST REC=16.5", 69%	PP = 0.50 tsf PP = 0.50 tsf PP = 0.75 tsf	13.5 - 15.0 ft: very hard drilling with rig chatter, light brown drilling fluid
21.5	16.5 - 20.0 ft: SILTY SAND, fine to medium grained sand, wet, gray with speckles of white, estimated 15 - 25% shell fragments, medium sand to fine gravel sized moderately weathered to fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SM	-11.4			S-8, SPT 3+6+10+ REC=11", 61%		15.0 - 16.5 ft: very hard drilling with rig chatter, light grayish white drilling fluid
25.0	18.5 ft: Changes to with streaks of white, estimated 5 - 10% cemented sands, medium to coarse sand sized highly weathered shell fragments, coarse sand to fine gravel sized cemented sands, weak HCl reaction (with cemented sands), weak to moderate cementation	SM	-14.9		25	S-9, SPT 7+11+12 REC=11.5", 64%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	16.5 - 18.5 ft: pushed pitcher sample 24", 16.5" recovery (bottom 0.5 inch deformed)
27.0	20.0 - 21.5 ft: SILTY SAND, fine to medium grained sand, moist, gray with streaks of white, estimated 15 - 25% shell fragments, estimated <5% cemented sands, weak cementation, highly to moderately weathered shell fragments, coarse sand sized cemented sand, strong HCl reaction (with shells), weak HCl reaction (with cemented sands)	SM	-16.9			UD-3, UNDIST REC=23", 96%		16.5 - 20.0 ft: uniform drilling resistance, smooth drilling, light gray drilling fluid
35.0	21.5 - 25.0 ft: SILTY SAND WITH GRAVEL, fine to coarse grained sand, angular to subangular particles, moist, gray with mottles of white, estimated 30 - 45% shell fragments, estimated 30 - 45% cemented sands, coarse sand to coarse gravel cemented sands, medium sand to fine gravel size highly weathered shell fragments, strong HCl reaction (with shells and cemented sands), weak HCl reaction (with soil), coarse sand to coarse gravel and some medium sands are either cemented sands or shell fragments, weak to strong cementation	SM	-24.9		30	S-10, SPT 19+32+19 REC=14", 78%		21.5 - 23.5 ft: pushed pitcher sample 24", 23" recovery
	23.5 ft: Changes to with streaks of white					S-11, SPT 5+5+11 REC=17", 94%		21.5 - 25.0 ft: hard drilling with some chatter
	25.0 - 27.0 ft: SILTY SAND, fine to medium grained sand, moist, grayish green with streaks of light brownish white, estimated 15 - 25% shell	SM				S-12, SPT 2+3+2 REC=18", 100%	PP = 3.50 tsf PP = 3.50 tsf PP = 4.00 tsf	25.0 - 27.5 ft: uniform drilling resistance, smooth drilling, light brownish white drilling fluid
						UD-4, SPT REC=23", 96%		31.5 - 33.5 ft: pushed pitcher sample 24", 23" recovery
						S-13, SPT 3+3+6 REC=17", 94%		
						S-14, SPT 6+7+11 REC=18", 100%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04 22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	fragments, estimated <5% cemented sands, light brownish white and white shell fragments, medium to coarse sand sized highly to moderately weathered shell fragments, fine gravel sized cemented sands, strong HCl reaction (with shells), weak HCl reaction (with cemented sands and soil)	SM				S-15, SPT 4+6+8 REC=18", 100%		
38.4	27.0 - 35.0 ft: SILTY SAND, fine grained sand, moist, gray with streaks of white, estimated 5 - 10% shell fragments, medium to coarse sand sized highly to moderately weathered shell fragments, weak HCl reaction (with shells), strong HCl reaction (with shells), contains 1" thick lense of SANDY SILT (ML), fine sand, gray, very soft at 28.1	CL	-28.3			S-16, SPT 4+7+10 REC=18", 100%		37.5 - 38.4 ft: jar labeled as S-16A
39.5	29.5 ft: Changes to fine to medium grained sand, gray with speckles of white, estimated <5% shell fragments, moderately weathered to fresh shell fragments,	SM	-29.4		40	S-17, SPT 4+5+7 REC=18", 100%		37.5 - 40.0 ft: light greenish gray drilling fluid
41.5	31.2 ft: Changes to gray with streaks of white, estimated 15 - 25% shell fragments, highly to moderately weathered shell fragments		-31.4			UD-5, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	38.4 - 39.0 ft: jar labeled as S-16B
	31.5 ft: Changes to gray with speckles of white, estimated <5% shell fragments, no HCl reaction with soil					S-18, SPT 4+7+11 REC=18", 100%		41.5 - 43.5 ft: pushed pitcher sample 24"; 24" recovery
	33.5 ft: Changes to grayish green with speckles of white, estimated <5% shell fragments, medium sand sized highly to moderately weathered shell fragments				45	S-19, SPT 4+6+8 REC=18", 100%		
	35.0 - 38.4 ft: SILTY SAND, fine to medium grained sand, moist, grayish green, contains mica, no HCl reaction, homogenous structure	SM				S-20, SPT 2+4+4 REC=18", 100%		
	38.4 - 39.5 ft: SANDY LEAN CLAY, fine grained sand, moist, grayish green with speckles of light brown, estimated <5% shell fragments, hard, homogenous structure, medium sand sized moderately weathered to fresh shell fragments, contains mica, strong HCl reaction (with shells), weak HCl reaction (with soil)					S-21, SPT 4+5+10 REC=18", 100%		
	39.5 - 41.5 ft: SILTY SAND, fine grained sand, moist, grayish green, contains mica, homogenous structure, no to weak HCl reaction				50			
51.5	41.5 - 51.5 ft: SILTY SAND, fine grained sand, moist, grayish green with streaks of brownish white, estimated <5% shell fragments, homogenous structure, highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)		-41.4			UD-6, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	51.5 - 53.5 ft: pushed pitcher sample 24"; 24" recovery
	43.5 ft: Changes to fine grained sand, with speckles of light brownish white, contains mica, weak HCl reaction (with soil)	SM				S-22, SPT 6+10+11 REC=18", 100%		53.5 ft: switched to 3 1/2" OD tricone roller bit and advanced to 81.5 ft, uniform drilling resistance,
	44.3 ft: Changes to estimated 5 - 10% shell fragments, medium to coarse sand sized moderately to highly weathered shell fragments				55	S-23, SPT		
	45.0 ft: Changes to estimated <5% shell fragments							

(continued)

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DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	grained sand, moist, grayish green, contains mica, weak HCl reaction, hard					REC=18", 100%		75.4 - 76.5 ft: jar labeled as S-31B (continued)
	77.5 ft: Changes to homogenous structure	MH				S-32, SPT 4+6+8 REC=18", 100%		
79.5	79.5 - 81.5 ft: ELASTIC SILT WITH SAND, fine grained sand, moist, grayish green, contains mica, weak HCl reaction, hard, homogenous structure	MH	-69.4		80	S-33, SPT 4+5+7 REC=18", 100%		
81.5	81.5 - 83.5 ft: SANDY ELASTIC SILT, fine grained sand, moist, grayish green, contains mica, weak HCl reaction, hard, homogenous structure	MH	-71.4			UD-7, UNDIST REC=22", 92%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	81.5 ft: switched to 6" OD tricone roller bit, reamed borehole from 53.5 to 81.5; mixed new batch of lean mud (25 lbs powdered bentonite to ~100 gal water)
83.5	83.5 - 85.0 ft: ELASTIC SILT WITH SAND, fine grained sand, moist, grayish green, contains mica, weak HCl reaction, hard, homogenous structure	MH	-73.4			S-34, SPT 6+7+10 REC=18", 100%		81.5 - 83.5 ft: pushed pitcher sample 24"; 22" recovery
85.0	85.0 - 92.0 ft: SANDY ELASTIC SILT, fine grained sand, moist, grayish green, contains mica, weak HCl reaction, hard, homogenous structure		-74.9		85	S-35, SPT 4+6+9 REC=18", 100%		83.5 - 85.0 ft: switched to 3-1/2" tricone roller bit; uniform resistance, smooth drilling, gray drilling fluid
		MH				S-36, SPT 4+4+7 REC=18", 100%		
	90.0 ft: Changes to grayish green with mottles of gray				90	S-37, SPT 4+6+9 REC=18", 100%		
92.0	92.0 - 95.0 ft: ELASTIC SILT WITH SAND, fine grained sand, moist, grayish green, contains mica, weak HCl reaction, hard, homogenous structure	MH	-81.9			S-38, SPT 7+10+11 REC=18", 100%		92.5 - 95.0 ft: greenish gray drilling fluid
95.0	95.0 - 95.7 ft: ELASTIC SILT, fine grained sand, moist, grayish green, contains mica, weak HCl reaction,	MH	-84.9		95	S-39, SPT 6+8+10 REC=18", 100%		95.0 - 95.7 ft: jar labeled as S-39A
95.7			-85.6					

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
	hard, homogenous structure 95.7 - 105.0 ft: SILTY SAND, fine grained sand, moist, grayish green, contains mica, weak HCl reaction 97.5 ft: Changes to olive gray, homogenous structure	SM					95.7 - 96.5 ft: jar labeled as S-39B (continued) 97.5 - 100.0 ft: dark greenish gray drilling fluid
		SM			S-40, SPT 5+6+8 REC=18", 100%		
		SM			S-41, SPT 5+8+10 REC=18", 100%		
					UD-8, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	101.5 ft: switched to 6" OD tricone roller bit, reamed borehole from 81.5 to 101.5 ft 101.5 - 103.5 ft: pushed pitcher sample 24"; 24" recovery
105.0	105.0 - 107.0 ft: SANDY ELASTIC SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm, homogenous structure	MH	-94.9		S-42, SPT 4+12+13 REC=18", 100%		103.5 ft: switched to 3 1/2" OD tricone roller bit and advanced to 111.5 ft, uniform drilling resistance, smooth drilling, grayish green drilling fluid
107.0	107.0 - 109.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, homogenous structure	SM	-96.9		S-43, SPT 4+5+9 REC=18", 100%		105.0 - 107.5 ft: gray drilling fluid
109.5	109.5 - 111.5 ft: SANDY ELASTIC SILT, fine grained sand, moist, grayish green, contains mica, weak HCl reaction, hard, homogenous structure	MH	-99.4		S-44, SPT 5+6+8 REC=18", 100%		107.5 - 110.0 ft: light olive gray drilling fluid
111.5	111.5 - 113.5 ft: SILTY SAND, fine grained sand, moist, grayish green, contains mica, weak HCl reaction	SM	-101.4		S-45, SPT 5+7+9 REC=18", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	
113.5	113.5 - 115.0 ft: SILTY SAND, fine to medium grained sand, moist, olive gray, contains mica, weak HCl reaction, homogenous structure	SM	-103.4		UD-9, UNDIST REC=23", 96%		113.5 ft: switched to 3 1/2" OD tricone roller bit and advanced to 121.5 ft, uniform drilling resistance, smooth drilling, greenish gray
115.0	114.5 ft: Changes to with streaks of light brownish white, estimated <5% shell fragments, light brownish white shells, highly weathered shell fragments	SM	-104.9		S-46, SPT 4+5+7 REC=18", 100%		
		SM			S-47, SPT 2+5+6 REC=16", 89%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
117.5	115.0 - 117.5 ft: SILTY SAND, fine to medium grained sand, olive gray with streaks of white, estimated 5 - 10% shell fragments, white shell fragments, medium to coarse sand sized moderately to highly weathered shell fragments, weak to strong HCl reaction (with shells), no to weak HCl reaction (with soil)	SM	-107.4			S-48, SPT 4+5+9 REC=12", 67%		drilling fluid 115.0 ft: switched to 6" OD tricone roller bit, reamed borehole from 101.5 to 121.5 ft 115.1 - 113.5 ft: pushed pitcher sample 24"; 23" recovery 117.5 - 120.0 ft: light olive gray drilling fluid
121.5	117.5 - 121.5 ft: SILTY SAND, fine to medium grained sand, wet, olive gray with streaks of light brownish white, estimated 15 - 25% shell fragments, contains mica, light brown and light brownish white shell fragments, medium sand to fine gravel sized shell fragments, no HCl reaction (with soil), weak to strong HCl reaction (with shells) 120.0 ft: Changes to fine grained sand, moist, olive gray with streaks of white, estimated <5% shell fragments, medium to coarse sand sized highly to moderately weathered shell fragments 121.5 - 140.0 ft: SILTY SAND, fine to medium grained sand, moist, grayish green, contains mica, weak HCl reaction, some pockets/layers <0.5 inch thick of mostly medium grained sand 125.0 ft: Changes to fine grained sand, homogenous structure	SM	-111.4		120	S-49, SPT 2+3+7 REC=17", 94%		
						UD-10, UNDIST REC=18", 75%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	121.5 - 123.5 ft: pushed pitcher sample 24"; 18" recovery
					125	S-50, SPT 5+8+16 REC=18", 100%		123.5 - 125.0 ft: switched to 3 1/2" tricone roller bit and advanced to 131.5 ft, uniform drilling resistance, smooth drilling, light olive gray drilling fluid
						S-51, SPT 3+5+8 REC=15", 83%		125.0 - 127.5 ft: grayish green drilling fluid
						S-52, SPT 3+4+7 REC=18", 100%		
		SM			130	S-53, SPT 4+4+6 REC=18", 100%		
						UD-11, UNDIST REC=22.5", 94%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	131.5 ft: switched to 6" OD tricone roller bit and reamed borehole from 121 to 131.5 ft 131.5 - 133.5 ft: pushed pitcher sample 24"; 22.5" recovery
						S-54, SPT 6+7+8 REC=0", 0%		
					135	S-55, SPT 3+6+9 REC=0", 0%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
							135.0 - 137.5 ft: sampler basket was inverted, possibly due to suction pulling sample back out of spoon (continued)
		SM			S-56, SPT 3+6+12 REC=0", 0%		137.5 - 140.0 ft: no recovery, new basket used, good condition, ball chuck valve at top of spoon free and loose, poor recovery may be due to soils made soft by drilling fluid
140.0	140.0 - 141.5 ft: SILTY SAND, fine grained sand, moist, grayish green, contains mica, weak HCl reaction, homogenous structure	SM	129.9		S-57, SPT 4+8+12 REC=18", 100%		137.5 - 140.0 ft: dark greenish gray drilling fluid, cuttings contain fine to medium sand with some medium to coarse sized shell fragments and small clumps (<0.5 inch), of fine sandy silt/silty sand
141.5	141.5 - 150.0 ft: SANDY ELASTIC SILT, fine grained sand, moist, grayish green, contains mica, weak HCl reaction, hard		131.4		UD-12, UNDIST REC=20", 83%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	
	143.5 ft: Changes to homogenous structure				S-58, SPT 8+9+12 REC=18", 100%		
		MH			S-59, SPT 5+9+12 REC=18", 100%		
					S-60, SPT 6+9+11 REC=18", 100%		
150.0			139.9				

Bottom of Boring at 150.0 ft.

Additional Remarks

117.5 ft: Permeation of drilling fluid into sample may have influenced "wet" sample appearance for Sample S-48

140 ft: Switched to 6" OD tricone and reamed borehole from 131.5 to 141.5 ft

141.5 - 143.5 ft: Pushed pitcher sample 24"; 20" recovery

143.5 ft: Switched to 3 1/2" OD tricone roller bit and advanced to 150 ft

143.5 - 145 ft: Uniform drilling resistance, smooth drilling, dark greenish gray drilling fluid

Please refer to original field log for End of Day groundwater observation depths

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-775**
Schnabel No.: 06120048
Sheet: 1 of 6

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/17/08 Finished: 7/21/08

Easting: 961091.5 ft Northing: 219105.3 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 9.7 (ft) Total Depth: 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/17	4:50 PM	7.5'	7.5'	---
End of Day	7/17	6:40 PM	1.0'	9.0'	---
Start of Day	7/18	7:25 AM	2.8'	9.0'	---
Completion	7/18	1:25 PM	9.2'	9.0'	18.6'
Start of Day	7/21	8:53 AM	8.3'	9.0'	9.2'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.2	0.0 - 0.2 ft: Topsoil, organics, grass		9.5			S-1, SPT 4+4+13 REC=11", 61%		0.0 - 2.5 ft: advanced 4 1/4" ID HSA to 9 ft; bit chatter from 0 to 0.8 ft; brown cuttings; changes as noted below. see end of boring for additional remarks
2.0	0.2 - 2.0 ft: FILL, sampled as poorly graded sand with gravel, medium to coarse grained sand, subrounded particles, moist, brown, estimated <5% crushed stone, no HCl reaction, rounded fine gravel		7.7			S-2, SPT 3+6+6 REC=14", 78%		2.5 - 5.0 ft: uniform drilling resistance, gray cuttings at 3 ft
4.5	2.0 - 4.5 ft: FILL, sampled as clayey sand, fine to coarse grained sand, subangular to rounded particles, moist, gray and brown, estimated <5% fine gravel, estimated <5% crushed stone, estimated <5% shell fragments, fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	FILL	5.2			S-3, SPT 3+12+14 REC=16", 89%		5.0 ft: orangish brown cuttings
7.0	4.5 - 7.0 ft: POORLY GRADED SAND, medium to coarse grained sand, subrounded to subangular particles, moist, brownish orange, estimated 5 - 10% fine gravel, no HCl reaction, subrounded gravel	SP	2.7			S-4, SPT WOH+1/12" REC=13", 72%		7.5 - 9.0 ft: switch to 3 1/2" OD tricone roller bit (mud rotary) and advanced to 100 ft
10.5	7.0 - 10.5 ft: POORLY GRADED SAND, fine to coarse grained sand, subrounded to subangular particles, wet, estimated <5% clay, no HCl reaction	SP	-0.8			S-5, SPT 3+4+2 REC=11", 61%		7.5 - 10.0 ft: Uniform resistance, smooth drilling, brown drilling fluid
12.0	10.5 - 12.0 ft: POORLY GRADED SAND, medium to coarse grained sand, subrounded particles, wet, light brown, no HCl reaction	SP	-2.3			S-6, SPT 5+9+13 REC=12", 67%		13.0 ft: bit chatter, gray drilling fluid
14.5	12.0 - 14.5 ft: POORLY GRADED SAND, medium grained sand, subrounded particles, wet, dark gray, contains a 0.5 inch layer of fine gravel, fine gravel as cemented sands at 13.9 ft, strong HCl reaction (with cemented sand), no HCl reaction (with soil)	SP	-4.8					
	14.5 - 17.0 ft: SILTY SAND, fine to	SM						

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04 22 GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
17.0	medium grained sand, wet, gray, estimated 5 - 10% fine gravel, estimated 5 - 10% shell fragments, strong HCl reaction, fine gravel as cemented sands, coarse to fine gravel size fresh shell fragments, moderate to strong cementation	SM	-7.3			S-7, SPT 12+44+50/3" REC=14", 78%		15.0 - 17.5 ft: uniform drilling resistance, smooth drilling
19.5	17.0 - 19.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated <5% fine to coarse gravel, estimated <5% shell fragments, weak HCl reaction, strong cementation, coarse gravel as cemented sands from 17.5 to 18 ft, fresh to moderately weathered shell fragments	SP-SM	-9.8			S-8, SPT 14+7+6 REC=18", 100%		18.5 - 19.5 ft: bit chatter
24.5	19.5 - 24.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, coarse sand to fine gravel size fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-14.8		20	S-9, SPT 3+5+8 REC=15", 83%		20.0 - 22.5 ft: uniform drilling resistance, smooth drilling
27.0	22.5 ft: Changes to coarse sand to fine gravel size fresh to highly weathered shell fragments		-17.3			S-10, SPT 4+4+12 REC=18", 100%		
29.5	24.5 - 27.0 ft: POORLY GRADED SAND, fine grained sand, moist, dark gray, estimated 5 - 10% silt, estimated <5% fine gravel, estimated <5% shell fragments, strong HCl reaction, moderate cementation, fine gravel as cemented sands, coarse sand to fine gravel size highly weathered shell fragments	SP	-19.8		25	S-11, SPT 11+2+5 REC=17", 94%		
32.0	27.0 - 29.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, estimated <5% shell fragments, coarse sand to fine gravel size fresh to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-22.3			S-12, SPT 4+5+9 REC=18", 100%		
34.5	29.5 - 32.0 ft: SILTY SAND, fine grained sand, moist, dark gray, estimated <5% fine gravel, estimated <5% shell fragments, strong HCl reaction, moderate cementation, fine gravel as cemented sands, coarse sand to fine gravel size fresh to highly weathered shell fragments	SM	-24.8		30	S-13, SPT 4+19+25 REC=18", 100%		
	32.0 - 34.5 ft: POORLY GRADED SAND, fine grained sand, wet, dark gray, estimated 5 - 10% silt, estimated <5% shell fragments, weak HCl reaction, coarse sand to fine gravel size moderately weathered shell fragments	SP				S-14, SPT 3+5+8 REC=18", 100%		32.5 - 35.0 ft: Uniform drilling resistance, smooth drilling
	34.5 - 37.0 ft: POORLY GRADED SAND WITH SILT, fine to medium	SP-SM			35			

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	grained sand, wet, olive gray, estimated <5% shell fragments, no HCl reaction, coarse sand size moderately weathered shell fragments	SP-SM				S-15, SPT 5+6+8 REC=18", 100%		
37.0	37.0 - 39.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, fine gravel size highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-27.3			S-16, SPT 5+6+8 REC=18", 100%		
39.5	39.5 - 42.0 ft: SANDY SAND, fine grained sand, moist, olive gray, contains mica, no HCl reaction	SM	-29.8		40	S-17, SPT 6+9+11 REC=18", 100%		
42.0	42.0 - 44.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand size highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SM	-32.3			S-18, SPT 5+7+8 REC=18", 100%		
44.5	44.5 - 47.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, estimated <5% shell fragments, fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-34.8		45	S-19, SPT 4+6+9 REC=18", 100%		
47.0	47.0 - 49.5 ft: SANDY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand size, moderately weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SM	-37.3			S-20, SPT 6+7+7 REC=18", 100%		
49.5	49.5 - 52.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-39.8		50	S-21, SPT 4+5+7 REC=16", 89%		
52.0	52.0 - 54.5 ft: POORLY GRADED SAND, fine to medium grained sand, wet, olive gray, contains mica, estimated 5 - 10% silt, estimated 5 - 10% shell fragments, coarse sand to fine gravel size fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SP	-42.3			S-22, SPT 5+12+14 REC=18", 100%		42.5 - 45.0 ft: Uniform drilling resistance, smooth drilling
54.5	54.5 - 59.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell	SM	-44.8		55	S-23, SPT		52.5 - 55.0 ft: Uniform drilling resistance, smooth drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	fragments, strong HCl reaction, coarse sand size highly weathered shell fragment				5+7+9	REC=18", 100%		
	57.5 ft: Changes to estimated <5% shell fragments	SM			S-24, SPT 5+8+11	REC=18", 100%		
59.5	59.5 - 63.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, firm, coarse sand size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	ML	-49.8		S-25, SPT 6+9+12	REC=18", 100%		
63.0	62.5 ft: Changes to weak HCl reaction				S-26, SPT 8+10+10	REC=18", 100%		62.5 - 65.0 ft: Uniform drilling resistance, smooth drilling
	63.0 - 77.0 ft: SILTY SAND, fine grained sand, moist, brownish gray, contains mica, estimated <5% shell fragments, coarse sand size highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)		-53.3		S-27, SPT 5+7+9	REC=18", 100%		
	67.5 ft: Changes to olive gray, estimated <5% shell fragments, strong HCl reaction (with soil)	SM			S-28, SPT 5+6+9	REC=18", 100%		
	70.0 ft: Changes to weak HCl reaction				S-29, SPT 5+7+9	REC=18", 100%		
					S-30, SPT 6+8+9	REC=18", 100%		72.5 - 75.0 ft: Uniform drilling resistance, smooth drilling
					S-31, SPT 5+8+7			

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-775
Schnabel No.: 06120048
Sheet: 5 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
77.0	77.0 - 98.5 ft: SILT, moist, olive gray, contains mica, weak HCl reaction, firm	SM	-67.3			REC=18", 100%		
						S-32, SPT 7+8+10 REC=18", 100%		
					80	S-33, SPT 8+9+10 REC=18", 100%		
						S-34, SPT 7+10+12 REC=18", 100%		82.5 - 85.0 ft: Uniform drilling resistance, smooth drilling
					85	S-35, SPT 8+10+11 REC=18", 100%		
						S-36, SPT 7+8+10 REC=18", 100%		
					90	S-37, SPT 7+9+11 REC=18", 100%		
						S-38, SPT 7+10+12 REC=18", 100%		92.5 - 95.0 ft: Uniform drilling resistance, smooth drilling
					95	S-39, SPT 9+12+13 REC=18", 100%		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-775**
Schnabel No.: 06120048
Sheet: 6 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
98.5	98.5 - 100.0 ft: SANDY SILT, fine grained sand, moist, contains mica, weak HCl reaction	ML	-88.8			S-40, SPT 9+9+11 REC=18", 100%		
100.0		ML						

Bottom of Boring at 100.0 ft.

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

DRAFT

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-776**
Schnabel No.: 06120048
Sheet: 1 of 3

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-Cone Roller Bit,
6" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/22/08 Finished: 7/23/08

Easting: 961053.7 Northing: 219143 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 9.6 (ft) Total Depth: 51.5 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/22	3:08 PM	11.0'	10.0'	---
Start of Day	7/23	7:18 AM	8.5'	14.5'	---
Completion	7/23	8:10 AM	3.8'	14.5'	50.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
2.0	0.0 - 2.0 ft: FILL, sampled as poorly graded sand with gravel, medium to coarse grained sand, angular particles, moist, brown, estimated <5% crushed stone, no HCl reaction	FILL	7.6			S-1, SPT 3+12+13 REC=13", 72%		0.0 - 0.0 ft: Advanced 4 1/4" I.D. HSA to 14.5 ft at 0 to 25 ft interval rig chatter to 0.3 ft, brown cuttings. Changes as noted below. See end of boring log for additional remarks.
	2.0 - 7.0 ft: FILL, sampled as silty sand, medium grained sand, subangular particles, moist, gray and brown, estimated <5% shell fragments, coarse sand size, strong HCl reaction (with shells), strong HCl reaction (with soil)	FILL				S-2, SPT 2+4+6 REC=9", 50%		2.5 - 5.0 ft: Uniform drilling resistance, easy drilling
	5.0 ft: Changes to medium to coarse grained sand, subrounded particles, brown, estimated <5% fine gravel, estimated <5% crushed stone, no HCl reaction				5	S-3, SPT 6+12+8 REC=13", 72%		5.0 - 7.5 ft: rig chatter at 6.0 ft, brown and gray cuttings
7.0	7.0 - 9.5 ft: SILTY SAND, fine to medium grained sand, moist, orangish brown, no HCl reaction, 0.25 inch lenses of SANDY SILT (ML), fine sand, moist, light gray	SM	2.6			S-4, SPT 4+5+5 REC=14", 78%		7.5 - 10.0 ft: Uniform drilling resistance, smooth drilling, brown cuttings
9.5	9.5 - 12.5 ft: SILTY SAND, medium to coarse grained sand, subangular particles, wet, orangish brown and light gray, no HCl reaction, layers of LEAN CLAY (CL)	SM	0.1		10	S-5, SPT 3+1+2 REC=14", 78%		
12.5	12.5 - 17.5 ft: SILTY SAND, fine grained sand, moist, greenish gray, estimated 5 - 10% shell fragments, coarse sand to fine gravel size fresh shell fragments, fine gravel as cemented sands, contains a 3-inch layer of POORLY GRADED SAND (SP), fine sand, wet, dark gray at 13.5 ft, strong HCL reaction (with shells and soil), strong cementation, (cemented sands surrounding shell fragments)	SM	-2.9		15	S-6, SPT 20+26+9 REC=18", 100%		13.5 - 14.5 ft: Uniform drilling resistance smooth drilling despite cemented sands. 14.5 ft: Switch to 3 1/2" O.D.

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
17.5	17.5 - 27.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, olive gray, estimated <5% fine gravel, estimated 5 - 10% shell fragments, contains cemented sands, gravel as cemented sands, coarse sand to fine gravel size moderately to highly weathered shell fragments	SM	-7.9					tricone roller bit (mud rotary), and advanced to 50.0 ft. mix one bag of bentonite with 125 gallons of water to make drilling fluid. 14.5 ft: 14.5 - 18.5 ft: uniform drilling resistance, smooth drilling, brownish gray drilling fluid. 18.5 - 23.5 ft: gray drilling fluid
	23.5 ft: Changes to estimated <5% fine to coarse gravel, estimated <5% shell fragments	SP-SM						
27.0	27.0 - 32.0 ft: SILTY SAND, fine grained sand, moist, olive gray, estimated <5% fine gravel, estimated <5% shell fragments, fine gravel as cemented sands, coarse sand to fine gravel size moderately to high weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil), strong cementation	SM	-17.4					
32.0	32.0 - 36.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, olive gray, estimated <5% shell fragments, fine gravel size moderately weathered shell fragments, contains a 5 inch layer of SILTY SAND (SM) at 34.1 ft, strong HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-22.4					28.5 - 33.5 ft: bit chatter from 24.0 to 24.5 ft.
36.0	36.0 - 38.3 ft: SILT, moist, olive gray	ML	-26.4					
								33.5 - 36.5 ft: Uniform drilling resistance, smooth drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
38.3	38.3 - 42.5 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, no HCl reaction	ML	-28.7		S-11, SPT 4+8+11 REC=18", 100%		36.5 - 38.3 ft: pushed Shelby tube 20", no pocket penetrometer readings could be taken due to damaged tube. (continued)
42.5	42.5 - 47.8 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	ML	-32.9		S-12, SPT 5+7+10 REC=18", 100%		
46.5	46.5 ft: Changes to contains shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM			UD-2, SH REC=16", 103%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	46.5 - 47.8 ft: pushed Shelby tube pushed 16", 16" recovery
47.8	47.8 - 51.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells and soil)	SP-SM	-38.2		S-13, SPT 4+5+7 REC=17", 94%		47.5 - 50.0 ft: Uniform drilling resistance, greenish gray drilling fluid
50.0	50.0 ft: Changes to estimated 5 - 10% shell fragments, fresh to moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)				S-14, SPT 6+6+10 REC=18", 100%		
51.5			-41.9				

Bottom of Boring at 51.5 ft.

Boring backfilled with bentonite and cement grout using tremie pipe upon completion. Please refer to original field log for End of Day groundwater observation depths

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-778
Schnabel No.: 06120048
Sheet: 1 of 5

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: K. Bell

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-Cone Roller Bit,
6-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 8/18/08 **Finished:** 8/20/08

Easting: 960740 ft **Northing:** 219075 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 114± (ft) **Total Depth:** 121.5 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Start of Day	8/19	7:20 AM	2.5'	9.0'	---
Encountered	8/19	12:55 PM	43.5'	9.0'	---
Start of Day	8/20	7:20 AM	52.0'	9.0'	---
Encountered	8/20	2:38 PM	108.5'	9.0'	---
Completion	8/20	5:45 PM	13.4'	9.0'	48.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
0.4	0.0 - 0.4 ft: Rootmat and topsoil	ML	113.1			S-1, SPT 1+4+6 REC=17", 94%		0.0 ft: advanced 6 1/4" ID HSA to 10 ft
2.0	0.4 - 2.0 ft: SANDY SILT, fine grained sand, moist, light brown, no HCl reaction, soft		111.5					0.0 - 2.5 ft: uniform drilling resistance, smooth drilling, orangish brown cuttings; changes as noted below, see end of boring for additional remarks
	2.0 - 13.5 ft: SILTY SAND, fine grained sand, moist, orangish brown, no HCl reaction	SM				S-2, SPT 9+13+13 REC=18", 100%		
	5.0 ft: Changes to orangish-brown and light gray, contains a 1-inch layer of SANDY LEAN CLAY (CL) at 6.4 ft				5	S-3, SPT 6+9+8 REC=18", 100%		
	6.5 ft: Changes to light orangish brown					UD-1, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	6.5 - 8.5 ft: pushed shelby tube 24", 24" recovery
						S-4, SPT 6+9+11 REC=13", 72%		6.5 - 10.0 ft: brought the bottom of augers up to 9 ft to switch to mud rotary
	10.0 ft: Changes to orangish brown with bands of light gray				10	S-5, SPT 11+11+11 REC=18", 100%		10.0 ft: switched to 6" OD tricone roller bit (mud rotary) and advanced to 113.5 ft, mixed
	11.5 ft: Changes to light orangish brown, lensed, 0.25 inch pockets of LEAN CLAY (CL)					UD-2, UNDIST REC=24", 100%	PP = 0.75 tsf PP = 1.00 tsf PP = 0.75 tsf	125 gals of water with one bag of bentonite
13.5	13.5 - 21.0 ft: POORLY GRADED SAND, fine to medium grained sand, moist, orangish brown with bands of light gray, estimated 5 - 10% silt, no HCl reaction, lensed, contains 0.25 to 0.75 inch pockets of LEAN CLAY (CL)	SP	100.0			S-6, SPT 6+8+9 REC=12", 67%		11.5 - 13.5 ft: pushed pitcher sample 24", 24" recovery
	18.5 ft: Changes to light orangish brown, contains a 1-inch layer of LEAN CLAY (CL) at 19.3 ft				15	S-7, SPT 5+10+12 REC=12", 67%		13.5 - 18.5 ft: uniform drilling resistance, smooth drilling, brown drilling fluid

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
21.0	21.0 - 23.5 ft: SILTY SAND, fine to medium grained sand, moist, orangish brown, estimated <5% fine gravel, no HCl reaction	SP	92.5				
23.5	23.5 - 25.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, orangish brown, no HCl reaction	SM	90.0		UD-3, UNDIST REC=11", 46%		21.5 - 23.5 ft: pushed pitcher sample 24", 11" recovery, tube not preserved, jar sample taken and labeled UD-3
25.5	25.5 - 28.0 ft: SILTY SAND, fine grained sand, moist, orangish brown, no HCl reaction	SP-SM	88.0		UD-4, UNDIST REC=12", 50%		23.5 ft: flush hole to remove cuttings
28.0	28.0 - 38.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, orangish brown with bands of light gray, no HCl reaction, contains a 0.5-inch layer of LEAN CLAY (CL) at 29.8 ft	SM	85.5		S-8, SPT 3+5+8 REC=10", 56%		23.5 - 25.5 ft: pushed pitcher sample 24", 12" recovery, tube not preserved, jar sample taken and labeled as UD-4
31.5	31.5 ft: Changes to orangish brown	SP-SM			S-9, SPT 6+5+5 REC=13", 72%		
35.5	35.5 ft: Changes to orangish brown with bands of light gray, stratified, 0.13 to 0.25 inch layers of LEAN CLAY (CL), moist, light gray, soft	SP-SM			UD-5, UNDIST REC=12", 50%		31.5 - 33.5 ft: pushed pitcher sample 24", 12" recovery, tube not preserved, jar sample taken and labeled as UD-5
38.0	38.0 - 39.1 ft: SANDY LEAN CLAY, fine grained sand, moist, light gray, no HCl reaction, soft, lensed, 0.13 to 0.25 inch pockets of POORLY GRADED SAND (SP), fine sand, moist, orangish brown	CL	75.5		UD-6, UNDIST REC=10.5", 44%	PP = 1.00 tsf PP = 1.00 tsf PP = 1.00 tsf	33.5 - 35.5 ft: pushed pitcher sample 24", 10.5" recovery
39.1	39.1 - 43.5 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, contains mica, no HCl reaction, soft	CL	74.4		S-10, SPT 6+7+7 REC=11", 61%		
43.5	43.5 - 47.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, contains mica, no HCl reaction, (perched water)	SP-SM	70.0		S-11, SPT 2+2+3 REC=17", 94%		38.5 - 39.0 ft: jar labeled as S-11A 39.0 - 40.0 ft: jar labeled as S-11B
					UD-7, UNDIST REC=19", 79%	PP = 1.25 tsf PP = 1.75 tsf PP = 1.50 tsf	41.5 - 43.5 ft: pushed pitcher sample 24", 19" recovery
					S-12, SPT 1+2+3 REC=14", 78%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
47.5	47.5 - 51.0 ft: LEAN CLAY, moist, dark gray, contains mica, no HCl reaction, firm, contains a 2 inch layer of POORLY GRADED SAND (SP), fine sand, wet, dark gray at 48.8 ft, contains a 0.5 inch layer of POORLY GRADED SAND (SP), fine sand, wet, dark gray at 49.1 ft	CL	66.0			S-13, SPT 2+4+6 REC=18", 100%		48.5 - 51.5 ft: grayish brown drilling fluid
51.0	51.0 - 53.5 ft: SANDY SILT, fine grained sand, moist, dark gray, contains mica, no HCl reaction, firm	ML	62.5			UD-8, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	51.5 - 58.5 ft: gray drilling fluid
53.5	53.5 - 67.5 ft: SILTY SAND, fine grained sand, moist, dark, contains mica, no HCl reaction	SM	60.0			S-14, SPT 6+7+9 REC=17", 94%		
58.5 - 61.5 ft: olive gray						S-15, SPT 6+6+8 REC=15", 83%		
61.5	61.5 - 67.5 ft: POORLY GRADED GRAVEL WITH SAND, fine grained sand, moist, dark gray, no HCl reaction, strong cementation, gravel as cemented sand 63.5 ft: Changes to fine gravel	GP	52.0			UD-9 REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	61.5 - 63.5 ft: pushed pitcher sample 24", 24" recovery
						S-16, SPT 50/4" REC=4", 83%		63.5 - 68.5 ft: bit chatter, hard, slow drilling from 63 ft to 64 ft
67.5	67.5 - 71.0 ft: SANDY LEAN CLAY, fine grained sand, moist, olive gray, contains mica, no HCl reaction, soft	CL	46.0			S-17, SPT 2+2+3 REC=18", 100%		68.5 - 71.5 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid
71.0	71.0 - 77.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, no HCl reaction, soft	ML	42.5			UD-10, UNDIST REC=24", 100%	PP = 2.50 tsf PP = 2.25 tsf PP = 2.25 tsf	71.5 - 73.5 ft: pushed pitcher sample 24", 24" recovery
73.5 ft: Changes to firm						S-18, SPT		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
					75	4+5+5 REC=18", 100%		
77.5	77.5 - 86.0 ft: SILT, moist, olive gray, contains mica, no HCl reaction	ML	36.0		80	S-19, SPT 3+4+7 REC=18", 100%		
	83.5 ft: Changes to estimated <5% shell fragments, strong HCl reaction, fine gravel size moderately weathered shell fragments	ML				UD-11, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.00 tsf	81.5 - 83.5 ft: pushed pitcher sample 24", 24" recovery 81.5 - 88.5 ft: olive gray drilling fluid
86.0	86.0 - 87.5 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, no HCl reaction, firm	ML	27.5		85	S-20, SPT 6+9+15 REC=18", 100%		
87.5	87.5 - 91.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated 5 - 10% shell fragments, estimated 5 - 10% fine gravel, moderate cementation, coarse sand to fine gravel size moderate to highly weathered shell fragments, fine gravel as cemented sand, strong HCl reaction	SM	26.0		90	S-21, SPT 17+20+22 REC=14", 78%		
91.5	91.5 - 93.5 ft: POORLY GRADED GRAVEL, moist, olive gray, estimated <5% silt, estimated 15 - 25% shell fragments, strong cementation, fine gravel size fresh shell fragments, gravel as cemented sands, strong HCl reaction (with shells and cemented sands)	GP	22.0			UD-12, UNDIST REC=12", 50%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	91.5 ft: flushed hole with drilling fluid to remove cuttings
93.5	93.5 - 95.5 ft: POORLY GRADED SAND, fine to medium grained sand, wet, olive gray, contains shell fragments, coarse sand sized fresh shell fragments, strong HCl reaction (with shells and soil)	SP	20.0			UD-13, UNDIST REC=14", 58%	PP = 0.00 tsf PP = 0.50 tsf PP = 0.50 tsf	91.5 - 93.5 ft: pushed pitcher sample 24", 2" recovery, 3" hard layer at 92.5 ft encountered during push, tube not preserved, jar sample taken and labeled UD-12
95.5	95.5 - 97.5 ft: POORLY GRADED SAND, fine to medium grained sand, moist, olive gray, contains mica, estimated 5 - 10% shell fragments, coarse sand to fine gravel size fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP	18.0		95	S-22, SPT 12+19+22 REC=12", 67%		91.5 - 93.5 ft: rig chatter from 92.5 to 92.8 ft, olive gray drilling fluid
97.5	97.5 - 103.5 ft: POORLY GRADED SAND, fine to medium grained sand,	SP	16.0			S-23, SPT 19+22+50/3" REC=10", 64%		93.5 - 95.5 ft: pushed pitcher sample 24", 14" recovery
					100			

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
103.5	moist, olive gray, estimated 5 - 10% shell fragments, coarse sand sized, moderately weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SP	10.0		UD-14, UNDIST REC=20", 83%	PP = 0.00 tsf PP = 0.50 tsf PP = 0.25 tsf	98.5 - 101.5 ft: bit chatter/hard, slow drilling from 99.7 to 100.2 ft (continued)
103.5 - 111.0	103.5 - 111.0 ft: POORLY GRADED SAND, fine to medium grained sand, moist, olive gray, estimated <5% shell fragments, coarse sand sized moderate to highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SP			S-24, SPT 11+11+18 REC=13", 72%		101.5 - 103.5 ft: pushed pitcher sample 24", 20" recovery
108.5	108.5 ft: Changes to coarse sand size highly weathered shell fragments, weak HCl reaction (with soil), encountered water table				S-25, SPT 6+8+11 REC=18", 100%		101.5 - 103.5 ft: hammer energy testing not conducted below 100 ft for this rig/hammer/rod system
111.0	111.0 - 117.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, contains shell fragments, coarse sand to fine gravel size fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	2.5		UD-15, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	111.5 - 113.5 ft: pushed sample 24", 24" recovery
113.5	113.5 ft: Changes to fine to medium grained sand, estimated 15 - 25% shell fragments, medium sand to fine gravel size fresh to moderately weathered shell fragments	SM			S-26, SPT 10+16+21 REC=18", 100%		113.5 - 118.5 ft: switched to 3-1/2" OD tricone roller bit and advanced to 121.5 ft; 113.5 - 118.5 ft interval: smooth drillig, olive gray drilling fluid
117.5	117.5 - 119.5 ft: SILTY SAND, fine grained sand, moist, olive gray, estimated 5 - 10% shell fragments, estimated 5 - 10% fine gravel, strong HCl reaction, strong cementation, coarse sand to fine gravel, fine gravel as cemented sands	SM	-4.0		S-27, SPT 50/6" REC=5", 83%		
119.5	119.5 - 121.5 ft: SILTY SAND WITH GRAVEL, fine to medium grained sand, moist, estimated 5 - 10% shell fragments, medium sand to fine gravel size fresh to highly weathered shell fragments, fine gravel as cemented sands, strong HCl reaction (with shells and cemented sand), weak HCl reaction (with soil)	SM	-6.0		S-28, SPT 20+12+22 REC=17", 94%		118.5 - 120.0 ft: bit chatter/hard drilling from 118.5 to 119.5 ft, olive gray drilling fluid
121.5			-8.0				

Bottom of Boring at 121.5 ft.

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

Please refer to original field log for End of Day groundwater observation depths.

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-779**
Schnabel No.: 06120048
Sheet: 1 of 5

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 6-1/4" I.D. Hollow Stem Auger
3-1/2" O.D. Tri-cone Roller Bit,
6" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 8/13/08 Finished: 8/18/08

Easting: 960604.8 ft Northing: 218941.1 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 100.8 (ft) Total Depth: 102.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Start of Day	8/14	7:15 AM	4.5'	9.0'	---
Start of Day	8/15	7:30 AM	33.0'	9.0'	---
Encountered	8/15	8:48 AM	93.5'	9.0'	---
Start of Day	8/18	8:10 AM	57.5'	9.0'	---
Completion	8/18	10:55 AM	4.2'	9.0'	102.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.4	0.0 - 0.4 ft: ORGANIC SOIL		100.4			S-1, SPT 2+4+7 REC=18", 100%		0.0 - 2.5 ft: Advanced 6 1/4" I.D. HSA to 10.0 ft. 0.0 to 2.5 ft interval, uniform drilling resistance, smooth drilling, orangish brown cutting. Changes as noted below. See end of boring log for additional remarks.
2.0	0.4 - 2.0 ft: SILT, moist, light brown, no HCl reaction, firm	ML	98.8			S-2, SPT 5+5+7 REC=18", 100%		
4.5	2.0 - 4.5 ft: SANDY SILT, fine grained sand, moist, orangish brown, no HCl reaction, firm	ML	96.3			S-3, SPT 4+5+5 REC=18", 100%		
	4.5 - 8.3 ft: POORLY GRADED SAND, medium to coarse grained sand, subrounded particles, moist, light yellowish brown, no HCl reaction	SP			5	UD-1, UNDIST REC=21", 97%	PP = 0.75 tsf PP = 0.75 tsf PP = 0.75 tsf	6.5 - 8.3 ft: Pushed Shelby tube 22", 21" recovery
8.3	6.5 ft: Changes to fine to medium grained sand, orangish brown		92.5			S-4, SPT 10+13+21 REC=18", 100%		
9.9	8.3 - 9.9 ft: POORLY GRADED SAND WITH SILT, medium to coarse grained sand, subrounded particles, moist, orangish brown, no HCl reaction, weak cementation, contains a 0.25 inch layer of iron cemented sand at 8.6 ft	SP-SM	90.9		10	S-5, SPT 10+10+13 REC=18", 100%		10.0 ft: switched to 6" O.D. tricone roller bit (mud rotary) and advanced to 83.5 ft, mixed one bag of bentonite with 125 gallons of water to make mud
11.5	9.9 - 11.5 ft: POORLY GRADED SAND, fine to coarse grained sand, subangular to subrounded particles, moist, orangish brown, estimated 5 - 10% fine gravel, no HCl reaction, weak cementation	SP	89.3			UD-2, UNDIST REC=24", 100%	PP = 1.75 tsf PP = 2.00 tsf PP = 2.75 tsf	11.5 - 13.5 ft: Pushed pitcher sample 24", 24" recovery
	11.5 - 17.0 ft: SILTY SAND, medium to coarse grained sand, subrounded to subangular particles, moist, orangish brown, no HCl reaction	SM			15	S-6, SPT 7+11+9 REC=17", 94%		11.5 ft: uniform drilling resistance, smooth drilling
17.0	13.5 ft: Changes to fine to coarse gravel, orangish brown and light gray, estimated <5% fine gravel, 0.25 to 0.5 inch pockets of LEAN CLAY (CL)		83.8			S-7, SPT 6+5+6 REC=14", 78%		
	17.0 - 21.0 ft: SILTY SAND, fine grained sand, moist, light orangish brown, no HCl reaction	SM						

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
21.0	21.0 - 23.5 ft: SANDY LEAN CLAY, medium grained sand, moist, orangish brown and light gray, no HCl reaction	SM CL	79.8		UD-3, UNDIST REC=24", 100%	PP = 1.50 tsf PP = 1.00 tsf PP = 1.25 tsf	21.5 - 23.5 ft: Pushed pitcher sample 24", 24" recovery
23.5	23.5 - 27.0 ft: CLAYEY SAND, fine to medium grained sand, moist, orangish brown and light gray, no HCl reaction	SC	77.3		S-8, SPT 3+6+6 REC=14", 78%		
27.0	27.0 - 29.1 ft: SANDY LEAN CLAY, medium grained sand, moist, orangish brown and light gray, no HCl reaction, soft	CL	73.8				
29.1	29.1 - 31.5 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, contains mica, no HCl reaction, soft	CL	71.7		S-9, SPT 1+3+3 REC=16", 89%		28.5 - 29.1 ft: jar labeled as S-9A 29.0 ft: drilling fluid changes to grayish brown 29.1 - 30.0 ft: jar labeled at S-9B
31.5	31.5 - 33.5 ft: POORLY GRADED SAND, fine grained sand, moist, dark gray, contains mica, no HCl reaction	SP	69.3		UD-4, UNDIST REC=24", 100%	PP = 2.50 tsf PP = 3.00 tsf PP = 2.50 tsf	31.5 ft: Flush hole with drilling fluid to clear cuttings 31.5 - 33.5 ft: Pushed pitcher sample 24", 24" recovery
33.5	33.5 - 41.0 ft: LEAN CLAY, moist, dark gray, contains mica, no HCl reaction, soft, contains a 3.5 inch layer of POORLY GRADED SAND (SP), fine sand, wet, dark gray at 33.5 ft.	CL	67.3		S-10, SPT 2+3+5 REC=17", 94%		
	38.5 ft: Changes to firm, contains a 1/8 inch layer of POORLY GRADED SAND (SP) at 39.9 ft				S-11, SPT 3+4+5 REC=18", 100%		
41.0	41.0 - 51.0 ft: SILTY SAND, fine grained sand, moist, dark gray, contains mica, no HCl reaction	SM	59.8		UD-5, UNDIST REC=24", 100%	PP = 3.25 tsf PP = 4.25 tsf PP = 4.25 tsf	41.5 - 43.5 ft: Pushed pitcher sample 24", 24" recovery 41.5 - 48.5 ft: gray drilling fluid, removed cuttings from mud tub with a shovel

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
51.0	51.0 - 53.5 ft: SANDY SILT WITH GRAVEL, fine gravel, moist, olive gray, contains mica, estimated 50 - 100% fine gravel, fine gravel as cemented sand, no HCl reaction (with cemented sand), no HCl reaction (with soil)	SM	49.8		S-13, SPT 5+6+8 REC=18", 100%		
53.5	53.5 - 71.0 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, no HCl reaction, firm	ML	47.3		UD-6, UNDIST REC=12", 50%		51.5 - 53.5 ft: Pushed pitcher sample 24", 12" recovery, hard pushing at 52.5 ft, broke through hard material at 53.1 ft, tube not preserved, jar sample taken, (labeled as UD-6)
					UD-7, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	51.5 ft: Increased drilling resistance, rig chatter, slow drilling from 52.5 to 53.1 ft, gray drilling fluid
					S-14, SPT 2+4+4 REC=18", 100%		
					S-15, SPT 3+3+3 REC=18", 100%		
					UD-8, UNDIST REC=24", 100%	PP = 3.75 tsf PP = 3.25 tsf PP = 3.50 tsf	53.5 ft: Pushed pitcher sample 24", 24" recovery
					S-16, SPT 3+5+5 REC=18", 100%		53.5 - 58.5 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid
					S-17, SPT 5+5+8 REC=18", 100%		61.5 - 63.5 ft: Pushed pitcher sample 24", 24" recovery
71.0	71.0 - 77.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, contains fine gravel, contains shell fragments, strong cementation, fine gravel as cemented sand, moderately weathered shell fragments, strong HCl reaction	SM	29.8		UD-9, UNDIST REC=22", 92%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	71.5 ft: Pushed pitcher sample 24", 22" recovery
					S-18, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
77.0	73.5 ft: Changes to estimated <5% shell fragments, estimated <5% fine gravel, moderate cementation, coarse sand to fine gravel size moderately weathered shell fragments, fine gravel as cemented sand, strong HCl reaction (with shells and cemented sand), weak HCl reaction (with soil)	SM	23.8		75	10+25+50/2" REC=13", 72%		74.0 ft: bit chatter/increased drilling resistance
77.0 - 83.5	77.0 - 83.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, olive gray, contains mica, estimated 5 - 10% shell fragments, moderate cementation, medium sand to fine gravel size fresh to highly weathered shell fragments, fine gravel as sand, strong HCl reaction (with cemented sand), strong HCl reaction (with shells), strong HCl reaction (with soil)	SP-SM			80	S-19, SPT 18+19+19 REC=16", 89%		78.5 - 81.5 ft: Increased drilling resistance, bit chatter at 78.5 ft, broke through hard layer at 85.0 ft
83.5	81.5 ft: Changes to wet, olive brown, contains shell fragments, highly weathered shell fragments, strong HCl reaction (with shells and soil)		17.3			UD-10, UNDIST REC=16", 70%	PP = 0.50 tsf PP = 0.75 tsf PP = 0.50 tsf	81.5 - 83.4 ft: Pushed pitcher sample 23", 16" recovery, hard drilling/pushing at 83.1 ft, too hard to push further
83.5 - 87.0	83.5 - 87.0 ft: POORLY GRADED SAND, fine to medium grained sand, moist, olive gray, estimated 5 - 10% shell fragments, coarse sand to fine gravel size shell fragments, strong HCl reaction (with shells and soil)	SP			85	S-20, SPT 15+20+19 REC=11", 61%		83.5 ft: Switched to 3 1/2" O.D. tricone roller bit (mud rotary) and advanced to 88.5 ft
87.0	87.0 - 88.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, olive gray, estimated <5% shell fragments, coarse sand fine gravel size fresh to moderately weathered shell fragments, weak HCl reaction (with shells and soil)	SP-SM	13.8					87.0 - 87.5 ft: bit chatter, hard/slow drilling to 88.5 ft
88.5	88.5 - 98.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, olive gray, estimated <5% shell fragments, coarse sand size, highly weathered shell fragments, weak HCl reaction (with shells and soil)	SP-SM	12.3		90	S-21, SPT 7+7+11 REC=18", 100%		88.5 ft: Switched to 6" O.D. tricone roller bit and advanced to 100.0 ft
					95	S-22, SPT 4+4+6 REC=17", 94%		
						UD-11, UNDIST REC=14", 58%	PP = 1.00 tsf PP = 1.00 tsf PP = 1.50 tsf	96.5 - 98.5 ft: Pushed pitcher sample 24", 14" recovery resistance increased
98.5	98.5 - 100.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, wet, olive gray, estimated <5% shell fragments, coarse sand size highly weathered shell fragments, weak HCl reaction (with shells and soil)	SP-SM	2.3			S-23, SPT 4+5+8 REC=18", 100%		increased hard/slow drilling/pushing at 97.5 to 97.8 ft
100.0		SP-SM	0.8		100	UD-12, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf	

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-779**
Schnabel No.: 06120048
Sheet: 5 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
102.0	shells), no HCl reaction (with soil) 100.0 - 102.0 ft: POORLY GRADED SAND WITH SILT, fine gravel, moist, olive gray, contains mica, contains shell fragments, coarse sand size, moderately weathered shell fragments, weak HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-1.2				PP = 4.50 tsf	100.0 - 102.0 ft: Pushed pitcher sample 24", 24" recovery (continued)

Bottom of Boring at 102.0 ft.

DRAFT

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-780
Schnabel No.: 06120048
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/21/08 **Finished:** 7/21/08

Easting: 960609 ft **Northing:** 219544 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 9.7 (ft) **Total Depth:** 6.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Completion	7/21	---	---	6.0'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.0 - 0.5 ft	Topsoil, organics, grass					S-1, SPT 2+17+17 REC=13", 72%		0.0 ft: Advanced 4 1/4" ID HSA to 0.0 to 2.5 ft, augers walking, boring foreman got through at 1.0 ft, rig chatter from 2.0 to 2.5 ft, brown cuttings
0.5	0.5 - 2.0 ft: FILL, sampled as silty sand with gravel, fine to medium grained sand, moist, brown, estimated 30 - 45% rock fragments, no HCl reaction, coarse gravel to cobble size stone, size of rip rap inferred from exposed area 15 ft plant east of boring	FILL	9.2					
2.0	2.0 - 4.0 ft: FILL, sampled as silty gravel with sand, moist, gray, estimated 50 - 100% concrete, no HCl reaction, concrete is rip rap sized	FILL	7.7			S-2, SPT 50/1" REC=1", 83%		2.5 - 5.0 ft: rig chatter, light gray cuttings with pieces of concrete
4.0	4.0 - 6.0 ft: FILL, sampled as sandy silt with gravel, moist, light gray, no HCl reaction, (disintegrated concrete)	FILL	5.7			S-3, SPT 50/3" REC=3", 83%		5.0 - 6.0 ft: Rig chatter from 5.0 to 6.0 ft, driller states that the augers are on metal at 6.0 ft
6.0			3.7		5			

Bottom of Boring at 6.0 ft.

Boring refusal at 6 ft.

Boring backfilled with dry concrete and hydrated with the approval of the contractor

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04 22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-780A**
Schnabel No.: 06120048
Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/22/08 Finished: 7/22/08

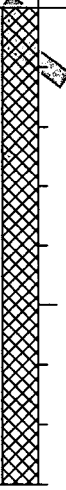
Easting: 960064 ft Northing: 219540 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 9.7 (ft) Total Depth: 8.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Completion	7/22	---	---	---	8.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
0.0 - 8.0	0.0 - 8.0 ft: FILL, sampled as poorly graded sand with silt, fine to coarse grained sand, subangular to angular particles, moist, estimated 5 - 10% fine gravel, no HCl reaction		1.7					0.0 - 6.0 ft: Advanced 4 1/4" ID HSA to 8.0 ft. 0 to 6.0 ft: rig chatter to 0.5 ft, augers walking at 0.1 ft. foreman stabilized auger, rig chatter from 5.0 - 6.0 ft.
					5			
						S-1, SS 2+2+4 REC=6", 33%		6.0 - 8.0 ft: Sampler deflected around 7 ft. Rig chatter/grinding from 6.0 7.5 ft, difficult drilling, brown cuttings, few cuttings, augers walking around 7 ft
Bottom of Boring at 8.0 ft. Boring backfilled with cement/bentonite grout upon completion. Boring terminated at 8.0 ft								



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-780B
Schnabel No.: 06120048
Sheet: 1 of 3

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/31/08 **Finished:** 7/31/08

Easting: 960624 ft **Northing:** 219530 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 10± (ft) **Total Depth:** 50.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	7/31	10:41 AM	10.0'	10.0'	---
Completion ▽	7/31	12:26 PM	5.1'	14.5'	15.4'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.0 - 8.0	See B-780 and B-780A for lithologic description							0.0 ft: advanced 4 1/4" ID HSA to 14.5 ft; changes as noted below see end of boring log for additional remarks 0.0 - 7.5 ft: bit chatter from 0 to 1 ft, auger walking at 0.2 ft; but boring forman stabilized auger, brown cuttings
8.0	7.5 - 12.0 ft: POORLY GRADED SAND, medium to coarse grained sand, subangular particles, wet, orangish brown, estimated <5% fine and coarse sand, contains 1 inch layer of SANDY LEAN CLAY (CL), medium sand, moist, brown, soft at 11.3 ft	SP	2.2		5	S-1, SPT 3+3+2 REC=0", 0%		7.5 - 10.0 ft: no recovery due to cohesionless soil, poorly graded sand cuttings, uniform drilling resistance, smooth drilling, brown cuttings
12.0	12.0 - 17.0 ft: POORLY GRADED SAND, fine to medium grained sand, wet, gray, estimated 5 - 10% fine gravel, estimated 5 - 10% shell fragments, fine gravel as cemented sands; coarse sand to coarse gravel size moderately to highly weathered shell fragments; strong HCl reaction (with shells and cemented sands), no HCl reaction (with soil), moderate to weak cementation	SP	-1.8		10	S-2, SPT 3+2+2 REC=11", 61%		12.0 - 13.0 ft: bit chatter
17.0	17.0 - 22.0 ft: POORLY GRADED SAND, fine grained sand, wet, dark gray, estimated <5% fine gravel, estimated <5% shell fragments, weak cementation, gravel as cemented sands; coarse sand to fine gravel sized highly weathered shell fragments; strong HCl reaction (with shells and	SP	-6.8		15	S-3, SPT 12+6+8 REC=16", 89%		14.5 ft: switched to 3 1/2" OD tricone roller bit (mud rotary) and advanced to 50.0 ft, mixed one bag of bentonite with 125 gallons of water to make drilling fluid 14.5 ft: uniform drilling, smooth drilling, gray drilling fluid
						S-4, SPT 9+9+10 REC=15", 83%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
22.0	cemented sands), no HCl reaction (with soil)	SP	-11.8				
22.0 - 27.5 ft:	POORLY GRADED SAND WITH SILT, moist, olive gray, contains mica, estimated 5 - 10% shell fragments, estimated <5% fine gravel, strong cementation, coarse sand to fine gravel size fresh to highly weathered shell fragments; fine gravel as cemented sands; strong HCl reaction (with shells and cemented sand), weak HCl reaction (with soil), cemented sands are concentrated in sample from 23.5 to 23.9 ft	SP-SM	-17.3		S-5, SPT 17+6+10 REC=17", 94%		
27.5 - 32.0 ft:	SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% fine gravel, estimated 5 - 10% shell fragments, strong HCl reaction, fine gravel as cemented sands; coarse sand to coarse gravel size fresh to highly weathered shell fragments; weak to moderate cementation cemented sands are concentrated in sample from 28.5 to 30.2 ft	SM	-21.8		S-6, SPT 27+16+15 REC=18", 100%		28.5 - 33.5 ft: olive gray drilling fluid
32.0 - 37.0 ft:	POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, no HCl reaction	SP-SM	-26.8		S-7, SPT 4+7+10 REC=18", 100%		
37.0 - 42.5 ft:	SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm	ML	-32.3		S-8, SPT 7+9+9 REC=18", 75%		38.5 - 40.0 ft: uniform drilling resistance, smooth drilling
42.5 - 47.5 ft:	SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, weak HCl reaction, coarse sand size fresh shell fragments	SM			S-9, SPT 7+9+12 REC=18", 100%		

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-780B**
Schnabel No.: 06120048
Sheet: 3 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		

47.5

47.5 - 50.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated 15 - 25% shell fragments, medium sand to coarse gravel size fresh to moderately weathered shell fragments; strong HCl reaction (with shells), weak HCl (with soil)
Bottom of Boring at 50.0 ft.

SM

-37.3

SP-SM

-39.8

50

S-10, SPT
7+8+11
REC=18", 100%

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
Please refer to original field log for End of Day groundwater observation depths.

DRAFT

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-781**
Schnabel No.: 06120048
Sheet: 1 of 3

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/21/08 Finished: 7/21/08

Easting: 960780.8 ft Northing: 219700.9 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 10.4 (ft) Total Depth: 50.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/21	1:05 PM	10.0'	10.0'	---
Completion	7/21	2:46 PM	5.0'	14.5'	18.7'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.0	0.0 - 2.0 ft: FILL, sampled as silty gravel with sand, moist, gray and light brown, estimated 50 - 100% crushed stone, no HCl reaction	FILL	8.4			S-1, SPT 14+20+22 REC=15", 83%		0.0 ft: advanced 4 1/4" ID HSA to 14.5 ft; rig chatter from 0 to 2 ft, gray cuttings changing to brown at 2.2 ft, changes as noted below, see end of boring log for additional remarks
2.0	2.0 - 4.5 ft: FILL, sampled as silty sand, medium grained sand, subangular particles, moist, orangish brown and gray, estimated 5 - 10% fine gravel, estimated <5% crushed stone, no HCl reaction	FILL	5.9			S-2, SPT 3+18+11 REC=12", 67%		2.5 - 5.0 ft: uniform drilling resistance, smooth drilling, brown cuttings
4.5	4.5 - 9.5 ft: FILL, sampled as clayey sand, medium grained sand, subrounded particles, moist, orangish brown, no HCl reaction	FILL	0.9			S-3, SPT 4+5+3 REC=12", 67%		
7.5	7.5 ft: Changes to estimated <5% crushed stone	FILL				S-4, SPT 2+2+2 REC=9", 50%		
9.5	9.5 - 12.5 ft: FILL, sampled as sandy clay, medium grained sand, wet, orangish brown, no HCl reaction, soft	FILL	-2.1			S-5, SPT 1+1+1 REC=4", 22%		10.0 - 13.5 ft: orangish brown cuttings
12.5	12.5 - 17.0 ft: POORLY GRADED SAND WITH SILT, medium grained sand, subrounded to subangular particles, wet, dark gray, estimated 5 - 10% shell fragments, strong HCl reaction, fine gravel size fresh shell fragments	SP-SM	-6.6			S-6, SPT 1+2+2 REC=11", 61%		12.5 - 14.0 ft: photograph shows incorrect depth should be 13.5 - 15.0 ft
17.0	17.0 - 22.0 ft: POORLY GRADED SAND, medium grained sand, subrounded particles, wet, dark gray, estimated <5% shell fragments, coarse sand to fine gravel size fresh to highly weathered shell fragments, strong HCL reaction (with shells), weak HCL reaction (with soil)	SP				S-7, SPT 4+5+6 REC=16", 89%		14.0 ft: cuttings change to gray 14.5 ft: switched to 3 1/2" OD tricone roller bit (mud rotary) and advanced to 50.0 ft. mix one bag of bentonite with 125 gallons of water 14.5 - 18.5 ft: uniform drilling resistance, smooth drilling,

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-781
Schnabel No.: 06120048
Sheet: 2 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
							gray drilling fluid
22.0	22.0 - 32.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, estimated <5% fine gravel, estimated <5% shell fragments, strong HCl reaction, moderate cementation, fine gravel as cemented sands, coarse sand to fine gravel size moderately to highly weathered shell fragments	SP	-11.6				
						S-8, SPT 8+20+13 REC=18", 100%	
					25		
	27.0 ft: Changes to highly weathered shell fragments	SP-SM					
						S-9, SPT 5+9+50/4" REC=16", -190%	
					30		28.5 - 33.5 ft: uniform drilling resistance, smooth drilling
32.0	32.0 - 37.0 ft: SANDY SILT, fine grained sand, moist, olive gray, no HCl reaction, firm	ML	-21.6				
						S-10, SPT 3+6+8 REC=18", 100%	
					35		
37.0	37.0 - 42.0 ft: SILT, moist, olive gray, contains mica, estimated <5% fine grained sand, weak HCl reaction, firm	ML	-26.6				
						S-11, SPT 6+8+9 REC=18", 100%	
					40		
42.0	42.0 - 47.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size moderately weathered shell fragments, strong HCL reaction (with shells), no HCL reaction (with soil)	SM	-31.6				
						S-12, SPT 4+6+10 REC=18", 100%	
					45		38.5 - 40.0 ft: uniform drilling resistance, smooth drilling

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-781**
Schnabel No.: 06120048
Sheet: 3 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
47.0	47.0 - 50.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated 5 - 10% shell fragments, coarse sand to fine gravel size moderately to highly weathered shell fragments, strong HCL reaction (with shells), no HCL reaction (with soil)	SP-SM	-36.6					
50.0			-39.6		50	S-13, SPT 3+6+9 REC=18", 100%		

Bottom of Boring at 50.0 ft.
Boring backfilled with bentonite upon completion.

DRAFT



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-782**
Schnabel No.: 06120048
Sheet: 1 of 3

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/23/08 **Finished:** 7/23/08

Easting: 961232.1 ft **Northing:** 218986.5 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 9.9 (ft) **Total Depth:** 51.5 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	7/23	9:40 AM	8.5'	7.0'	---
Completion ▽	7/23	1:15 PM	5.2'	14.5'	50.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.0 - 2.0	FILL, sampled as silty sand, fine to coarse grained sand, angular to subrounded particles, moist, brownish orange, estimated <5% crushed stone, estimated <5% fine gravel, no HCl reaction	FILL	7.9			S-1, SPT 11+13+13 REC=14", 78%		0.0 ft: advanced 4 1/4" ID HSA to 14.5 ft; at 0.0 to 2.5 ft interval, uniform drilling resistance, smooth drilling, brownish orange cuttings; changes as noted below; see end of boring log for additional remarks
2.0 - 4.5	FILL, sampled as silty sand, medium grained sand, subangular particles, moist, reddish brown and dark gray, estimated <5% shell fragments, estimated <5% fine gravel, coarse sand size fresh shell fragments; rounded gravel; strong HCl reaction (with shells), no HCl reaction (with soil)	FILL	5.4			S-2, SPT 1+3+4 REC=12", 67%		2.5 - 5.0 ft: brown cuttings
4.5 - 7.0	FILL, sampled as silty sand, medium to coarse grained sand, subangular particles, moist, brown and dark gray, estimated <5% crushed stone, no HCl reaction, contains a 2 inch layer of poorly graded sand, medium sand, subangular, moist, white at 6.3 ft	FILL	2.9			S-3, SPT 4+10+9 REC=14", 78%		
7.0 - 9.5	SILTY SAND, medium to coarse grained sand, rounded to subrounded particles, wet, orangish brown, no HCl reaction	SM	0.4			S-4, SPT 2+8+8 REC=13", 72%		
9.5 - 12.5	POORLY GRADED SAND WITH SILT, medium to coarse grained sand, rounded particles, wet, brownish orange, estimated <5% fine gravel, no HCl reaction, lensed, 0.5 inch pockets of SANDY LEAN CLAY (CL)	SP-SM	-2.6			S-5, SPT 2+2+3 REC=13", 72%		10.0 - 13.5 ft: orangish brown cuttings
12.5 - 17.5	POORLY GRADED SAND, medium grained sand, subrounded particles, wet, black, estimated <5% shell fragments, coarse sand size fresh shell fragments; strong HCl reaction (with shells), no HCl reaction (with soil)	SP				S-6, SPT 2+5+3 REC=13", 72%		13.5 - 14.5 ft: brown cuttings
17.5 - 22.0	POORLY GRADED	SP-SM	-7.6					14.5 ft: switch to 3 1/2" OD tricone roller bit (mud rotary and advanced to 50.0 ft. Mix 125 gallons of water with one bag of bentonite to make drilling fluid

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	SAND WITH SILT, fine to medium grained sand, wet, gray, estimated 5 - 10% fine gravel, estimated 5 - 10% shell fragments, strong HCl reaction, strong cementation, fine gravel as cemented sands; coarse sand to fine gravel size fresh shell fragments	SP-SM			20	S-7, SPT 15+11+7 REC=16", 89%		14.5 - 18.5 ft: bit chatter at 17.5 ft, gray drilling fluid (continued)
22.0	22.0 - 32.0 ft: POORLY GRADED SAND WITH SILT, moist, olive gray, contains mica, estimated <5% shell fragments, fine gravel size highly weathered shell fragments; strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-12.1		25	S-8, SPT 3+5+8 REC=17", 94%		
						UD-1, UNDIST REC=0", 0%		26.5 ft: Shelby tube push attempted; tube did not penetrate the soil, no sample recovered, no jar sample taken, tube not preserved
					30	S-9, SPT 4+6+9 REC=18", 100%		28.5 - 33.5 ft: greenish gray drilling fluid
32.0	32.0 - 37.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size fresh to highly weathered shell fragments; contains a 9-inch layer of fine gravel (as cemented sands); strong HCl reaction (with shells), weak HCl reaction (with soil); moderate to strong cementation	SM	-22.1		35	S-10, SPT 24+10+13 REC=18", 100%		
37.0	37.0 - 42.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size highly weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-27.1		40	S-11, SPT 5+7+10 REC=18", 100%		38.5 - 43.5 ft: uniform drilling resistance, smooth drilling, greenish gray drilling fluid
42.0		ML	-32.1					

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-782**
Schnabel No.: 06120048
Sheet: 3 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	42.0 - 46.5 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	ML			45	S-12, SPT 6+8+9 REC=18", 100%		
46.5	46.5 - 47.3 ft: SILTY SAND, fine grained sand, moist, olive green, contains mica, no HCl reaction	SM	-36.6			UD-2, UNDIST REC=9", 94%	PP = 4.50 tsf PP = 4.00 tsf PP = 4.40 tsf	46.5 - 47.3 ft: pushed shelby tube 9" recovery
47.3	47.3 - 51.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive green, contains mica, estimated <5% shell fragments, fine gravel size moderately weathered shell fragments; strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-37.4			S-13, SPT 4+8+12 REC=18", 100%		
	50.0 ft: Changes to fine gravel size fresh to moderately weathered shell fragments; strong HCl reaction (with shells), weak HCl reaction (with soil)				50	S-14, SPT 4+7+9 REC=18", 100%		
51.5			-41.6					

Bottom of Boring at 51.5 ft.

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

Please refer to original field log for End of Day groundwater observation depths.

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-787
Schnabel No.: 06120048
Sheet: 1 of 5

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 8/1/08 **Finished:** 8/4/08

Easting: 960596 ft **Northing:** 217782 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 50± (ft) **Total Depth:** 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	8/1	10:30 AM	18.5'	18.5'	---
Start of Day	8/4	8:10 AM	17.5'	19.5'	---
Completion	8/4	9:25 AM	5.1'	19.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
2.0	0.0 - 2.0 ft: FILL, sampled as silty sand, fine to medium grained sand, moist, orangish brown with mottles of light gray, no HCl reaction	FILL	47.9			S-1, SPT 1+4+3 REC=13", 72%		0.0 ft: advanced 4 1/4" ID HSA to 19.5 ft
4.5	2.0 - 4.5 ft: FILL, sampled as clayey sand, fine to medium grained sand, moist, orangish brown with mottles of light gray, no HCl reaction	FILL	45.4			S-2, SPT 2+3+4 REC=13", 72%		0.0 - 2.5 ft: uniform resistance, smooth drilling, brown cuttings, changes as noted below, see end of boring logs for additional remarks
7.0	4.5 - 7.0 ft: FILL, sampled as sandy lean clay, fine grained sand, moist, orangish brown with mottles of gray, no HCl reaction	FILL	42.9		5	S-3, SPT 1+2+3 REC=10", 56%		
9.5	7.0 - 9.5 ft: FILL, sampled as silty sand, fine to medium grained sand, moist, brown with mottles of gray, estimated <5% crushed stone, no HCl reaction, contains 1 inch layer of Lean Clay (CL) at 8.4 ft	FILL	40.4		10	S-4, SPT 1+3+5 REC=13", 72%		
14.2	9.5 - 14.2 ft: FILL, sampled as poorly graded sand, fine to medium grained sand, moist, orangish brown with bands of light gray, estimated <5% fine gravel, no HCl reaction, moderate cementation, fine gravel as cemented sands	FILL	35.7		15	S-5, SPT 3+6+7 REC=17", 94%		13.5 - 14.2 ft: jar labeled as S-6A
17.5	14.2 - 17.5 ft: FILL, sampled as sandy lean clay, fine grained sand, moist, gray, estimated <5% crushed stone, estimated <5% fine gravel, contains 0.25 inch layer of iron cemented sands at 14.8 ft	FILL	32.4			S-6, SPT 2+2+3 REC=18", 100%		14.2 - 15.0 ft: jar labeled as S-6B
	17.5 - 22.5 ft: POORLY GRADED SAND, medium grained sand, subrounded particles, wet, brown with bands of brownish red, estimated <5% fine gravel, no HCl reaction, weak cementation, fine gravel as iron	SP				S-7, SPT 2+4+5 REC=17", 94%		19.5 ft: switched

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
22.5	cemented sands	SP	27.4				to 3 1/2" OD tricone roller bit (mud rotary) and advanced to 100 ft; mixed one bag of bentonite with 125 gallons of water to make drilling fluid
22.5 - 27.5 ft: SANDY SILT, fine grained sand, moist, dark gray, estimated <5% shell fragments, contains mica, coarse sand size highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	ML		25		S-8, SPT 3+4+5 REC=18", 100%		19.5 - 23.5 ft: uniform drilling resistance, smooth drilling, grayish brown drilling fluid (continued)
27.5	27.5 - 32.0 ft: SILTY SAND, fine grained sand, moist, dark gray, contains mica, estimated <5% shell fragments, estimated <5% fine gravel, moderate cementation, coarse sand sized moderate to highly weathered shell fragments, fine gravel as cemented sands, strong HCl reaction (with cemented sands), weak HCl reaction (with shells), no HCl reaction (with soil)	SM	22.4		S-9, SPT 3+4+9 REC=18", 100%		23.5 - 28.5 ft: gray drilling fluid
32.0	32.0 - 37.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, dark gray, contains mica, estimated 5-10% fine gravel, estimated <5% shell fragments, strong cementation, fine gravel as cemented sands, fresh to highly weathered shell fragments, strong HCl reaction (with cemented sands, shells and soil)	SP-SM	17.9		S-10, SPT 13+14+10 REC=18", 100%		
37.5	37.5 - 52.0 ft: POORLY GRADED SAND, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, coarse sand sized moderately weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SP	12.4		S-11, SPT 4+5+8 REC=17", 94%		
43.5 ft: Changes to coarse sand to fine gravel sized fresh shell fragments			45		S-12, SPT 4+5+6 REC=18", 100%		
							42.0 - 43.0 ft: bit chatter
							43.5 - 48.5 ft: uniform drilling resistance, smooth drilling

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	48.5 ft: Changes to coarse sand sized highly weathered shell fragments, weak HCl reaction (with shells)	SP			50	S-13, SPT 4+5+6 REC=18", 100%		
52.0	52.0 - 57.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel sized highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-2.1		55	S-14, SPT 3+5+6 REC=18", 100%		53.5 - 58.5 ft: bit chatter
57.0	57.0 - 62.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated 15 - 25% fine gravel, estimated 5 - 10% shell fragments, strong HCl reaction, strong cementation, fine gravel as cemented sands, coarse sand to fine gravel size fresh to highly weathered shell fragments	SP-SM	-7.1		60	S-15, SPT 26+16+8 REC=18", 100%		59.5 - 62.5 ft: intermittent bit chatter
62.5	62.5 - 67.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated 5 - 10% fine gravel, moderate to strong cementation, fine gravel as cemented sands, strong HCl reaction (with cemented sands and soil)	SP-SM	-12.6		65	S-16, SPT 50/2" REC=2", 83%		
67.0	67.0 - 72.5 ft: POORLY GRADED SAND, fine grained sand, wet, olive gray, contains mica, estimated <5% shell fragments, strong cementation, fine gravel sized highly weathered shell fragments, contains a 2 inch layer of fine gravel as cemented sand at 69.6 ft, strong HCl reaction (with cemented sands and shells), no HCl reaction (with soil)	SP	-17.1		70	S-17, SPT 6+12+50/4" REC=16", 103%		67.0 - 70.5 ft: bit chatter
72.5	72.5 - 77.5 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell	ML	-22.6			S-18, SPT		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
75	fragments, firm, coarse sand to fine gravel sized moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	ML			75	8+9+15 REC=18", 100%		73.5 - 78.5 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid (continued)
77.5	77.5 - 82.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand size highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-27.6		80	S-19, SPT 5+9+14 REC=18", 100%		
82.5	82.5 - 87.5 ft: SANDY SILT, fine grained sand, moist, olive gray, contains mica, weak HCl reaction, firm	ML	-32.6		85	S-20, SPT 9+10+12 REC=18", 100%		
87.5	87.5 - 92.5 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-37.6		90	S-21, SPT 7+10+16 REC=18", 100%		
92.5	92.5 - 97.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated 5 - 10% shell fragments, coarse sand to fine gravel sized fresh to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-42.6		95	S-22, SPT 7+11+12 REC=18", 100%		
97.5	97.5 - 100.0 ft: SILTY SAND, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, weak HCl reaction, coarse sand sized highly weathered shell fragments	SM	-47.6			S-23, SPT 8+11+15 REC=18", 100%		88.5 - 93.0 ft: flushed boring with water
100.0			-50.1		100			

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-787**
Schnabel No.: 06120048
Sheet: 5 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	Bottom of Boring at 100.0 ft. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.							
DRAFT								



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-788**
Schnabel No.: 06120048
Sheet: 1 of 3

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 6/27/08 Finished: 6/27/08

Easting: 960881.3 ft Northing: 217507.3 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 51.3 (ft) Total Depth: 50.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	6/27	9:52 AM	18.5'	10.0'	---
Completion	6/27	11:00 AM	2.5'	10.0'	49.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.0 - 2.0 ft	SANDY LEAN CLAY, fine grained sand, moist, brown, no HCl reaction	CL	49.3		S-1, SPT 1+3+4	REC=16", 89%		0.0 - 2.5 ft: Advanced 4 1/4" ID HSA to 10.0 ft.
2.0 - 3.5 ft	CLAYEY SAND, fine to medium grained sand, moist, light gray with mottles of orangish brown, no HCl reaction, moderate cementation, iron oxidation mottles	SC	47.8		S-2, SPT 3+5+5	REC=18", 100%		0.0 to 2.5 ft: Uniform drilling resistance, brown cuttings, changes as noted below. see end of boring log for additional remarks
3.5 - 7.0 ft	LEAN CLAY, moist, light gray with bands of orangish brown, estimated <5% fine grained sand, no HCl reaction, soft, iron oxidation bands	CL	44.3		S-3, SPT 2+4+5	REC=18", 100%		1.5 - 15.7 ft: Labeled as S-7A
7.0 - 9.0 ft	LEAN CLAY, moist, light gray with bands of orangish brown, no HCl, moderate cementation reaction, contains a 0.25 inch layer of cemented sands at 7.9 and 8.3 ft; iron oxidation mottles	CL	42.3		S-4, SPT 3+5+6	REC=18", 100%		2.5 - 3.5 ft: Jar labeled as S-2A
8.7 ft	Changes to gray							3.5 - 4.0 ft: Jar labeled as S-2B
9.0 - 14.5 ft	POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, dark gray, contains mica, no HCl reaction, moderate cementation, contains a 0.25 inch layer of cemented reddish fine sand at 10.1 ft	SP-SM	36.8		S-5, SPT 6+6+9	REC=18", 100%		5.0 - 7.5 ft: orangish gray cuttings
14.5 - 15.7 ft	SILTY SAND, fine grained sand, moist, dark gray, contains mica, no HCl reaction, moderate cementation, contains a 1 inch layer of fine cemented sands at 15.6 ft, brownish red, moderate cementation.	SM	35.6		S-6, SPT 3+8+15	REC=17", 94%		10.0 - 12.5 ft: Switched to 3 1/2" OD Tricone roller bit and advanced to 50.0 ft 10.0 ft: Uniform drilling resistance, smooth drilling, dark gray drilling fluid; changed to brown from 11.5 to 12 ft and back to dark gray.
15.7 - 26.5 ft	POORLY GRADED SAND, fine to medium grained sand, moist, light gray and brownish red, no HCl reaction, moderate cementation, contains interbeds of cemented fine sands, brownish red	SP			S-7, SPT 8+10+16	REC=12", 67%		12.5 - 15.0 ft: dark gray drilling fluid
18.5 ft	Changes to wet, dark gray,				S-8, SPT 8+10+16	REC=13", 72%		15.0 - 18.0 ft: gray drilling fluid
								15.7 - 16.5 ft: Labeled as jar S-7B

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-788
Schnabel No.: 06120048
Sheet: 2 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	estimated <5% silt							
	23.5 ft: Changes to estimated <5% shell fragments, weak HCl reaction (with shells)	SP			25	S-9, SPT 36+50/5" REC=11", 102%		
26.5	26.5 - 32.0 ft: SILTY SAND, fine grained sand, moist, dark gray, estimated <5% shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	24.8		30	S-10, SPT 4+5+6 REC=18", 100%		
32.0	32.0 - 36.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand, moist, dark gray, estimated 50 - 100% cemented sands, weak HCl reaction, fine to medium cemented sands, strong cementation	SP-SM	19.3		35	S-11, SPT 50/4" REC=3", 83%		32.0 ft: Bit chatter
36.0	36.0 - 50.0 ft: POORLY GRADED SAND, fine grained sand, wet, gray, estimated <5% silt, estimated 5 - 10% shell fragments, no HCl reaction	SP	15.3		40	S-12, SPT 18+7+6		33.5 - 38.5 ft: Uniform drilling resistance, smooth drilling, gray drilling fluid
	43.5 ft: Changes to fine to medium grained sand, subrounded particles, dark gray, estimated <5% silt, estimated <5% shell fragments, weak HCl reaction (with shells)	SP			45	S-13, SPT 6+9+9 REC=17", 94%		38.5 - 43.5 ft: Uniform drilling resistance, smooth drilling, gray drilling fluid

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

(continued)



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-788**
Schnabel No.: 06120048
Sheet: 3 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
50.0		SP	1.3		50	S-14, SPT 3+5+7 REC=16", 89%		

Bottom of Boring at 50.0 ft.

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

DRAFT

**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-789**
Schnabel No.: 06120048
Sheet: 1 of 6

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 6/26/08 **Finished:** 6/26/08

Easting: 961000 ft **Northing:** 217388.6 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 56± (ft) **Total Depth:** 100.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	6/26	10:24 AM	23.5'	10.0'	---
Completion	6/26	4:39 PM	11.5'	10.0'	76.5'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
0.5	0.0 - 0.5 ft: Topsoil, contains organics, contains roots	SM	55.8		S-1, SPT 1+1+2 REC=18", 100%		0.0 ft: Advanced 4 1/4" ID HSA to 10.0 ft, 0.0 to 2.5 ft: uniform drilling resistance, smooth drilling, orangish brown cuttings.
2.0	0.5 - 2.0 ft: SILTY SAND, fine to medium grained sand, moist, light brown with mottles of orangish brown, contains roots, contains fine gravel, no HCl reaction		54.3				changes as noted below.
4.5	2.0 - 4.5 ft: LEAN CLAY, moist, light gray with mottles of orangish red, contains fine to medium sand, no HCl reaction, soft, iron oxidation mottles	CL	51.8		S-2, SPT 1+2+4 REC=18", 100%		2.5 - 5.0 ft: orangish brown and gray cuttings
7.0	4.5 - 7.0 ft: SANDY LEAN CLAY, fine grained sand, moist, light gray with bands of reddish orange, contains roots, no HCl reaction, soft, iron oxidation bands	CL	49.3		S-3, SPT 3+3+4 REC=8", 44%		5.0 - 7.5 ft: orangish brown cuttings
9.5	7.0 - 9.5 ft: LEAN CLAY, moist, light gray with bands of reddish orange, estimated <5% fine grained sand, no HCl reaction, soft, iron oxidation bands	CL	46.8		S-4, SPT 2+2+5 REC=18", 100%		7.5 - 10.0 ft: increased drilling resistance at 9.0 ft, smooth drilling, brownish orange cuttings
12.0	9.5 - 12.0 ft: LEAN CLAY, moist, dark gray, contains mica, no HCl reaction, firm	CL	44.3		S-5, SPT 4+5+8 REC=18", 100%		10.0 - 12.5 ft: Switched to 3 1/2" O.D. tricone roller bit (mud rotary) and advanced to 98.5 ft: smooth drilling, gray drilling fluid, mud thinner added at 12.5 ft.
14.5	12.0 - 14.5 ft: SANDY LEAN CLAY, fine grained sand, moist, dark gray, contains mica, no HCl reaction, firm	CL	41.8		S-6, SPT 4+6+6 REC=18", 100%		
	14.5 - 19.7 ft: CLAYEY SAND, fine	SC					

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	grained sand, moist, dark gray, contains mica, no HCl reaction	SC				S-7, SPT 2+3+6 REC=18", 100%		
19.7	19.7 - 22.0 ft: SILTY SAND, fine to medium grained sand, moist, gray with bands of orange, iron oxidation bands, contains a 0.5 inch layer of iron cemented sands at 19.7 ft, no HCl reaction	SM	36.6		20	S-8, SPT 3+3+7 REC=18", 100%		18.5 - 19.7 ft: Jar sampled as S-8A
22.0	22.0 - 27.0 ft: POORLY GRADED SAND, fine to medium grained sand, wet, light brown, estimated <5% silt, no HCl reaction	SP	34.3		25	S-9, SPT 13+16+23 REC=13", 72%		19.7 - 20.0 ft: Jar labeled as S-8B 20.0 ft: grayish brown drilling fluid
27.0	27.0 - 32.0 ft: POORLY GRADED SAND, medium to coarse grained sand, subrounded particles, wet, dark gray, estimated <5% silt, no HCl reaction, contains 0.5 inch layers of LEAN CLAY (CL)	SP	29.3		30	S-10, SPT 1+2+1 REC=14", 78%		28.5 - 33.5 ft: increased drilling resistance at 33 ft, gray drilling fluid
32.0	32.0 - 37.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, dark gray, contains mica, estimated <5% shell fragments, strong HCl reaction (with shells and soil)	SP-SM	24.3		35	S-11, SPT 3+3+5 REC=18", 100%		33.5 - 38.5 ft: rig chatter from 37.0 ft to 38.0 ft

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
37.0	37.0 - 41.0 ft: SILTY SAND, fine grained sand, wet, dark gray, contains cemented sands, no HCl reaction, strong cementation	SP-SM	19.3					33.5 - 38.5 ft: rig chatter from 37.0 ft to 38.0 ft (continued)
		SM			40	S-12, SPT 50/5" REC=4", 83%		38.5 - 43.5 ft: drilling resistance increasing and decreasing intermittently
41.0	41.0 - 47.0 ft: POORLY GRADED, SAND WITH SILT, fine grained sand, wet, gray, estimated 15 - 25% shell fragments, weak HCl reaction (with shells and soil)	SP-SM	15.3					
		SP-SM			45	S-13, SPT 33+13+9 REC=18", 100%		
47.0	47.0 - 57.0 ft: POORLY GRADED SAND, fine to medium grained sand, wet, dark gray, estimated <5% shell fragments, estimated <5% silt, strong HCl reaction (with shells and soil)	SP	9.3					
		SP			50	S-14, SPT 7+8+12 REC=18", 100%		48.5 - 53.5 ft: Advanced tricone bit: uniform drilling resistance, smooth drilling, gray fluid
	53.5 ft: Changes to fine to medium grained sand, subrounded particles, strong HCl reaction (with shells), weak HCl reaction (with soil)				55	S-15, SPT 5+6+9 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
57.0	57.0 - 67.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, no HCl reaction	SP	-0.7					
					60	S-16, SPT 4+5+8 REC=18", 100%		58.5 - 60.0 ft: Advanced tricone bit: uniform drilling resistance, smooth drilling, gray drilling fluid
		SP-SM			65	S-17, SPT 4+5+7 REC=18", 100%		63.5 - 68.5 ft: rig chatter at 67.5 ft
67.5	67.5 - 72.0 ft: SILTY SAND, fine grained sand, wet, light gray, contains cemented sands, estimated 15 - 25% shell fragments, strong cementation, strong HCl reaction (with shells and soil)	SM	-11.2		70	S-18, SPT 16+22+50/5" REC=16", 95%		68.5 - 73.5 ft: intermittent rig chatter, gray drilling fluid
72.0	72.0 - 87.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated <5% shell fragments, strong HCl reaction (with shells) weak HCl reaction (with soil)	SP-SM	-15.7		75	S-19, SPT 14+14+27 REC=18", 100%		

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
						S-20, SPT 6+9+13 REC=18", 100%		78.5 - 83.5 ft: Advanced tricone bit: uniform drilling resistance, smooth drilling, gray drilling fluid
		SP-SM				S-21, SPT 8+9+14 REC=18", 100%		
87.0	87.0 - 92.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, olive gray, estimated <5% shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-30.7			S-22, SPT 6+8+13 REC=18", 100%		88.5 - 93.5 ft: Advanced tricone bit: uniform drilling resistance, smooth drilling, gray drilling fluid
92.0	92.0 - 100.0 ft: SILTY SAND, fine grained sand, moist, olive gray, estimated <5% shell fragments, weak HCl reaction (with shells and soil)	SM	-35.7			S-23, SPT 5+8+10 REC=18", 100%		93.5 - 98.5 ft: Advanced tricone bit: uniform drilling resistance, smooth drilling, gray drilling fluid

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



**TEST
BORING
LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-789**
Schnabel No.: 06120048
Sheet: 6 of 6

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
100.0	98.5 ft: Changes to strong HCl reaction (with shells and soil)	SM	43.7		100	S-24, SPT 7+8+10 REC=18", 100%		93.5 - 98.5 ft: Advanced tricone bit: uniform drilling resistance, smooth drilling, gray drilling fluid (continued)

Bottom of Boring at 100.0 ft.
Boring backfilled with cement/bentonite grout upon completion.

DRAFT

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-790**
Schnabel No.: 06120048
Sheet: 1 of 3

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 6/30/08 Finished: 7/1/08

Easting: 961110.5 ft Northing: 217278.1 ft By: Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 72.7 (ft) Total Depth: 49.7 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	6/30	5:22 PM	19.3'	19.5'	---
Start of Day	7/1	6:55 AM	25.1'	14.5'	---
Completion	7/1	7:22 AM	35.0'	14.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.2	0.0 - 0.2 ft: Asphalt	GW	72.5					0.0 ft: Advanced 4-1/4" ID HSA to 14.5 ft. 0.0 to 2.5 ft: uniform drilling resistance
0.6	0.2 - 0.6 ft: GRAVEL		72.1					smooth drilling, brownish, orange cuttings, changes as noted below, see end of boring log for additional remarks
	0.6 - 4.5 ft: SILTY SAND, fine and coarse grained sand, subangular particles, moist, orangish brown, no HCl reaction	SM				S-1, SPT 5+5+5 REC=17", 94%		2.5 - 5.0 ft: orangish brown cuttings
	2.5 ft: Changes to subrounded particles, light gray and brownish orange					S-2, SPT 4+3+3 REC=10", 56%		5.0 - 7.5 ft: brownish orange cuttings
4.5	4.5 - 7.0 ft: POORLY GRADED SAND, medium to coarse grained sand, subrounded particles, moist, brownish orange, estimated <5% fine to coarse gravel, no HCl reaction, subrounded gravel, contains a 0.25 inch layer of LEAN CLAY (CL), moist, light gray at 5.9 ft	SP	68.2		5	S-3, SPT 4+3+3 REC=13", 72%		7.5 - 10.0 ft: orangish brown cuttings
7.0	7.0 - 9.5 ft: POORLY GRADED SAND, fine to coarse grained sand, subrounded particles, moist, orangish brown, contains roots, estimated 5 - 10% fine to coarse gravel, no HCl reaction, subrounded gravel	SP	65.7			S-4, SPT 32+13+4 REC=4", 22%		
9.5	9.5 - 12.5 ft: LEAN CLAY WITH SAND, fine grained sand, moist, brownish orange and light gray	CL	63.2		10	S-5, SPT 2+5+6 REC=11", 61%		10.0 - 13.5 ft: brownish orange cuttings
12.5	12.5 - 22.0 ft: LEAN CLAY, moist, light gray with bands of brownish orange, estimated <5% fine grained sand, contains roots, no HCl reaction, firm, iron oxidation bands, 2 inch layer of POORLY GRADED SAND WITH SILT(SP-SM) wet, fine sand, wet dark gray at 19.3 ft	CL	60.2		15	S-6, SPT 2+4+4 REC=14", 78%		14.5 ft: switched to 3-1/2" OD tricone roller bit (mud rotary) and advanced to 48.5 ft. 2 bags of bentonite mixed with 124 gallons of water
						S-7, SPT 3+6+6 REC=18", 100%		14.5 ft: uniform drilling resistance, smooth drilling, brown drilling fluid

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/2/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
22.0	22.0 - 27.0 ft: LEAN CLAY, moist, dark gray, contains mica, no HCl reaction, firm	CL	50.7				18.5 - 23.5 ft: brownish gray drilling fluid (continued)
		CL			S-8, SPT 4+8+10 REC=18", 100%		23.5 - 28.5 ft: increased drilling resistance with depth, no distinct increase at a particular depth, gray drilling fluid
27.0	27.0 - 32.0 ft: CLAYEY SAND, fine grained sand, moist, dark gray, contains mica, no HCl reaction	SC	45.7				
		SC			S-9, SPT 6+11+15 REC=18", 100%		
32.0	32.0 - 37.0 ft: POORLY GRADED SAND, fine grained sand, wet, brown, estimated <5% shell fragments, medium sand size shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	SP	40.7				33.5 - 38.5 ft: uniform drilling resistance, smooth drilling
		SP			S-10, SPT 6+19+20 REC=13", 72%		
37.0	37.0 - 42.0 ft: POORLY GRADED SAND, fine grained sand, wet, dark gray, estimated <5% silt, no HCl reaction	SP	35.7				38.5 - 43.5 ft: No photograph taken of S-11 due to heavy rains
		SP			S-11, SPT 6+10+9 REC=12", 67%		
42.0	42.0 - 47.0 ft: POORLY GRADED SAND, fine to medium grained sand, wet, dark gray, no HCl reaction	SP	30.7				43.5 - 45.0 ft: loss of 125 gallons of drilling fluid
		SP			S-12, SPT 1/12+1" REC=7", 39%		45.0 ft: Mix 1 bag of bentonite with 100 gallons of water

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-790**
Schnabel No.: 06120048
Sheet: 3 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
47.0	47.0 - 49.7 ft: SILTY SAND, fine grained sand, moist, dark gray, contains mica, weak HCl reaction	SM	25.7					45.0 - 48.5 ft: uniform drilling resistance, loss of about 70 gallons of drilling fluid (<i>continued</i>)
49.7			23.0			S-13, SPT 6+8+50/2" REC=14", 97%		

Bottom of Boring at 49.7 ft.
Boring backfilled with betonite and cement grout using tremie upon completion.

DRAFT



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-791**
Schnabel No.: 06120048
Sheet: 1 of 8

Contractor: Connelly and Associates, Inc.
Frederick, Maryland
Contractor Foreman: T. Chew
Schnabel Representative: K. Bell
Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods
Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit
Hammer Type: Auto Hammer (140 lb)
Dates Started: 6/23/08 **Finished:** 6/24/08
Easting: 961245.1 **Northing:** 217143.5 **By:** Land Survey
Coordinate System: MD State Plane
Ground Surface Elevation: 84.5 (ft) **Total Depth:** 100.0 ft

Groundwater Observations					
	Date	Time	Depth	Casing	Caved
Encountered	6/23	---	15.0'	15.0'	---
Start of Day	6/24	8:30 AM	14.5'	19.0'	---
Completion	6/24	4:50 PM	15.1'	19.0'	26.4'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
	0.0 - 4.5 ft: FILL, sampled as silty sand, coarse grained sand, rounded particles, moist, brown and yellowish brown, estimated <5% fine gravel, estimated <5% roots, no HCl reaction, small roots 0-0.4 ft	FILL				S-1, SPT 1+5+6 REC=16", 89%		0.0 ft: Advanced 4-1/4" I.D. HSA to 19.0 ft. 0.0 to 2.5 ft: uniform drilling resistance, changes as noted below. see end of boring log for additional remarks
	2.6 ft: Changes to fine to medium grained sand, yellowish brown, no HCl reaction, subrounded gravel, contains 0.15 ft layer of silty sand, moist, dark brown mottled with grayish brown, fine gravel crumble			A		S-2, SPT 1+2+1 REC=14", 78%		2.6 - 5.0 ft: slight bit resistance (possible gravel), replaced split barrel sampler shoe
4.5	4.5 - 7.0 ft: PROBABLE FILL, sampled as silty sand, fine to coarse grained sand, moist, orangish brown, estimated <5% fine gravel, no HCl reaction, dark brown at 5.5 ft, changes to yellowish brown at 5.9 ft, subrounded gravel, contains very thin layer of pine bark at 5.5 ft, increased fines with depth stepped at 5.5 ft and 5.9 ft	FILL	80.0		5	S-3, SPT 1+2+4 REC=17", 94%		5.0 - 7.5 ft: slight bit resistance (possible gravel), changed to a new shoe for spoon
7.0	7.0 - 17.5 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, subrounded to subangular particles, moist, light brown, estimated <5% fine gravel, no HCl reaction, subangular gravel	SP-SM	77.5	B2		S-4, SPT 3+3+3 REC=15", 83%		7.5 - 10.0 ft: uniform drilling resistance

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-791
Schnabel No.: 06120048
Sheet: 2 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA	TESTS	REMARKS
					S-5, SPT 3+5+6 REC=17", 94%		10.0 - 12.5 ft: easy drilling
	12.5 ft: Changes to fine to medium grained sand, subrounded to subangular particles, light brown, no HCl reaction			B2	S-6, SPT 5+7+8 REC=17", 94%		12.5 - 15.0 ft: Hammer Energy test performed
	15.0 ft: Changes to wet, orangish brown, no HCl reaction				S-7, SPT 3+5+4 REC=15", 83%		15.0 - 19.0 ft: Switched to 3-1/2" O.D. Tricone Roller bit (mud rotary) and advanced to 98.5 ft
17.5	17.5 - 22.5 ft: SILTY SAND, fine to coarse grained sand, subrounded to subangular particles, wet, yellowish brown, estimated <5% fine gravel, no HCl reaction, subrounded gravel, contains 5" layer of LEAN CLAY WITH SAND (CL), moist, gray at 19.4 ft	SM	67.0		S-8, SPT 3+4+6 REC=15", 83%		19.0 - 23.5 ft: uniform drilling resistance
22.5	22.5 - 28.5 ft: SILTY SAND, fine to medium grained sand, wet, yellowish brown, estimated <5% fine gravel, no HCl reaction, angular to subangular gravel, gravels increase with depth	SM	62.0				

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008 04 22 GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-791**
Schnabel No.: 06120048
Sheet: 3 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
						S-9, SPT 4+14+18 REC=18", 100%		23.5 - 28.5 ft: Slight drilling resistance at 24.0 ft, (possible gravel), clay cuttings. Hammer Energy test performed
		SM			25			
28.5	28.5 - 42.0 ft: LEAN CLAY, moist, light gray, estimated <5% medium grained sand, contains mica, firm, homogeneous structure		56.0			S-10, SPT 3+4+5 REC=18", 100%		28.5 - 33.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid at 33.5 ft
					30			
		CL				S-11, SPT 4+4+6 REC=18", 100%		33.5 - 38.5 ft: easy drilling
	33.5 ft: Changes to estimated <5% fine grained sand, contains mica, firm, homogeneous structure				35			

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	38.5 ft: Changes to hard	CL				S-12, SPT 4+8+10 REC=18", 100%		33.5 - 38.5 ft: easy drilling (continued)
42.0	42.0 - 47.0 ft: SILTY SAND, fine grained sand, wet, gray, contains mica, no HCl reaction, homogeneous structure	SM	42.5			S-13, SPT 5+7+8 REC=18", 100%		38.5 - 43.5 ft: Hammer Energy test performed
47.0	47.0 - 51.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, reddish brown and yellowish brown, no HCl reaction, iron oxide cementation from 48.6 to 48.7 ft	SP-SM	37.5			S-14, SPT 91+100/2" REC=8", 95%		43.5 - 48.5 ft: slight bit chatter from 47.0 to 47.5 ft, (possible gravel), driller had considerable difficulty retrieving spoon
					50			48.5 - 53.5 ft: slower drilling rate, intermittent drilling resistance

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-791
Schnabel No.: 06120048
Sheet: 5 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
51.5	51.5 - 61.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, light gray, contains mica, no HCl reaction, homogeneous structure	SP-SM	33.0					48.5 - 53.5 ft: slower drilling rate, intermittent drilling resistance (continued)
						S-15, SPT 32+57+100/3" REC=9", 94%		53.5 - 58.5 ft: uniform drilling resistance, Hammer Energy test performed
		SP-SM			55			
						S-16, SPT 50/5" REC=5", 104%		58.5 - 63.5 ft: slight rig chatter from 62.0 to 63.5 ft, (possible gravel)
					60			
61.0	61.0 - 66.0 ft: SANDY SILT, moist, light gray, contains mica, no HCl reaction, soft, strong cementation (tip of SPT shoe)	ML	23.5					
						S-17, SPT 50/2"		

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-791
Schnabel No.: 06120048
Sheet: 6 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
						REC=2", 83%		63.5 - 68.5 ft: intermittent drilling resistance (continued)
		ML			65			
66.0	66.0 - 71.5 ft: SILTY SAND, fine to medium grained sand, wet, light gray, estimated <5% shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil), shell size increase with depth		18.5					
		SM				S-18, SPT 50/5" REC=5", 104%		68.5 - 73.5 ft: moderate resistance from 68.5 to 71.5; no resistance from 71.5 to 73.5. Hammer Energy test performed
					70			
71.5	71.5 - 82.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)		13.0					
		SP-SM				S-19, SPT 7+5+8 REC=18", 100%		73.5 - 78.5 ft: slight drilling resistance at 77.5 ft. (possible shells) Hammer Energy test performed
					75			

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
	78.5 ft: Changes to light gray and greenish gray, estimated <5% shell fragments, weak HCl reaction (with shells)	SP-SM			80	S-20, SPT 8+9+9 REC=18", 100%		78.5 - 83.5 ft: uniform drilling resistance, smooth drilling.
82.0	82.0 - 87.0 ft: SANDY LEAN CLAY, fine grained sand, wet, greenish gray, no HCl reaction, firm, homogeneous structure	CL	2.5		85	S-21, SPT 6+6+9 REC=17", 94%		83.5 - 88.5 ft: uniform drilling resistance, smooth drilling, Hammer Energy test performed
87.0	87.0 - 92.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray and greenish gray, estimated <5% shell fragments, no HCl reaction(both shells and soil)	SP-SM	-2.5		90	S-22, SPT 5+5+6 REC=18", 100%		88.5 - 93.5 ft: uniform drilling resistance, easy drilling.

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
92.0	92.0 - 98.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, gray and white, estimated <5% shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil), moderate to strong cementation	SP-SM	-7.5					88.5 - 93.5 ft: uniform drilling resistance, easy drilling. (continued)
						S-23, SPT 50/6" REC=6", 100%		93.5 - 98.5 ft: slight drilling resistance from 93.5 to 94, drillers added water to the mud at 98.5 ft, Hammer Energy test performed
98.5	98.5 - 100.0 ft: POORLY GRADED SAND WITH SILT, wet, gray, estimated <5% shells, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM	-14.0					
100.0			-15.5			S-24, SPT 9+13+14 REC=18", 100%		

Bottom of Boring at 100.0 ft.

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

**TEST BORING LOG**

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: B-821
Schnabel No.: 06120048
Sheet: 1 of 3

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass

Equipment: Diedrich D-50 (Turbo ATV); AWJ Rods

Method: 4-1/4" I.D. Hollow Stem Auger,
3-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 7/17/08 **Finished:** 7/17/08

Easting: 961124.6 **Northing:** 218736.3 **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 8.9 (ft) **Total Depth:** 50.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/17	12:00 AM	7.5'	7.5'	---
Completion	7/17	4:30 PM	12.5'	7.5'	19.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	DATA	TESTS	REMARKS
0.0 - 2.5	FILL, sampled as silty gravel, fine to coarse grained sand, angular particles, moist, light gray, no HCl reaction, stone base	FILL	6.4			S-1, SPT 21+32+27 REC=18", 100%		0.0 - 2.5 ft: advanced 4 1/4" ID HSA to 9.0 ft; from 0 to 2.5 ft, rig chatter throughout drilling interval, light gray cuttings; changes as noted below, see end of boring for additional remarks
2.5 - 4.5	FILL, sampled as sandy sand, medium to coarse grained sand, subangular particles, moist, brown and gray, estimated <5% fine gravel, estimated <5% shell fragments, estimated <5% crushed stone, fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	FILL	4.4			S-2, SPT 27+13+16 REC=18", 100%		2.5 - 5.0 ft: rig chatter to 2.8 ft (crushed stone base possibly ends at 2.8 ft), brown cuttings
4.5 - 9.5	POORLY GRADED SAND WITH SILT, medium grained sand, subangular particles, wet, dark gray, estimated 15 - 25% shell fragments, strong HCl reaction, medium to fine gravel size fresh shell fragments	SP-SM	-0.6		5	S-3, SPT 4+4+3 REC=0", 0%		5.0 - 7.5 ft: uniform drilling resistance, smooth drilling, dark gray cuttings
9.5 - 17.0	POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, contains mica, estimated <5% shell fragments, fine gravel size highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-8.1		10	S-5, SPT 2+3+5 REC=17", 94%		9.0 ft: switched 3 1/2" OD tricone roller bit (mud rotary) and advanced to 50 ft, mixed one bag of bentonite with 125 gallons of water to make drilling fluid, uniform drilling resistance, smooth drilling, gray drilling fluid
13.5 - 17.0	Changes to weak HCl reaction, coarse sand size moderately weathered shell fragments	SP-SM			15	S-6, SPT 3+3+5 REC=18", 100%		
17.0 - 22.0	SILTY SAND, fine grained sand, wet, gray, estimated 5 - 10% shell fragments, estimated <5% fine gravel, strong HCl reaction, strong cementation, coarse sand to coarse gravel size fresh to highly weathered shell fragments, fine gravel as cemented sands	SM				S-7, SPT 25+23+14 REC=16", 89%		17.5 ft: bit chatter, gray drilling fluid

(continued)

TEST BORING LOG 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_04_22.GDT 8/27/08

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH DATA	TESTS	REMARKS
22.0	22.0 - 32.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, dark gray, estimated <5% shell fragments, estimated <5% fine gravel, strong HCl reaction, moderate cementation, coarse sand to fine gravel size fresh to moderately weathered shell fragments, gravel as cemented sands	SM	-13.1				21.0 - 21.5 ft: bit chatter
		SP-SM					23.5 - 28.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
32.0	32.0 - 37.0 ft: SILTY SAND, fine grained sand, moist, olive gray, estimated <5% shell fragments, estimated <5% fine gravel, strong HCl reaction, strong cementation, coarse sand to fine gravel size highly weathered shell fragments, fine gravel as cemented sand	SM	-23.1				
		SP-SM					
37.0	37.0 - 42.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, wet, olive gray, estimated <5% shell fragments, weak HCl reaction, coarse sand size, highly weathered shell fragments	SM	-28.1				33.5 - 38.5 ft: uniform drilling resistance, smooth drilling
		SP-SM					
42.0	42.0 - 47.0 ft: SILTY SAND, fine grained sand, moist, olive gray, estimated <5% shell fragments, weak HCl reaction, coarse sand size, moderately to highly weathered shell fragments	SM	-33.1				43.5 - 48.5 ft: uniform drilling resistance, smooth drilling

(continued)



TEST BORING LOG

Project: CCNPP Subsurface Investigation
Calvert County, Maryland
Bechtel Job No. 23257

Boring Number: **B-821**
Schnabel No.: 06120048
Sheet: 3 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRA TUM	SAMPLING		TESTS	REMARKS
					DEPTH	DATA		
47.0	47.0 - 50.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand, moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand size, fresh shell fragments, strong HCl reaction with shells, weak HCl reaction with soil	SP-SM	-38.1					
50.0			-41.1		50	S-13, SPT 5+9+11 REC=18", 100%		

Bottom of Boring at 50.0 ft.

Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

DRAFT

- Handwritten Field SPT Logs -

Test Boring Checklist

CCNPP 2008 Subsurface Investigation
Bechtel Job No. 25237
Schnabel Project No. 08120048

Test Boring No. B-342
Date 7-31-08
8-6-08

Pre-Drill Check

Utility mark-out confirmed: Yes ☒ No ☐
Calibration of hammer verified: Yes ☒ No ☐
Location verified: Yes ☒ No ☐
Continuous sampling: 0 to 15 ft Yes ☒ No ☐
* Bottom 20 ft Yes ☒ No ☒
** Elevation +50 to -20 ft Yes ☒ No ☐
*** Entire Boring Yes ☒ No ☒
Rod Size (circle one): AW / AWJ / NW / NWJ / Other ()

Notes:

GPS elevation (staked)

is 76.0 ft.

Hammer previously confirmed

as #2.

Pre-drill approval:

(signature/date)

Donald C. Galloway 7/31/08
Sam Galloway 7/31/08

Drilling Check

Was water, mud, or casing necessary to maintain hole integrity per procedure T01?

Yes ☒ No ☐ If yes, describe method used:

Switch to mud rotary at 12.5 ft

Split-spoon sampler correct size and in good condition? Yes ☒ No ☐
SPTs conducted in accordance with ASTM D1586? Yes ☒ No ☐
Thin-walled tubes correct size and in good condition? Yes ☒ No ☒ (N/A)
Samples labeled per procedure T01? Yes ☒ No ☐
Borehole abandoned per procedure T01? Yes ☒ No ☐

Drilling Summary

Describe drilling method(s) used: 4 1/2" ID HSA 0-12.5 ft, 3 1/4" OD tricone

rotary roller bit (mud rotary) 12.5-250 ft.

Total depth of hole: 250 ft

Drilling without sampling: N/A

No. cement bags for grouting: 7

No. UD samples: N/A

Deviations and Unusual Conditions


Gross tremle pipe grouted in-place. Pipe was "sitted" in
and could not be removed from the borehole. Kenny Meggins, upon
checking with Bechtel/Construction officials, granted permission to
grout the pipe in-place. Approx 2.18 feet of pipe was grouted in-place.



Prepared By:

Donald C. Galloway 9/6/08 (Schnabel Site Superintendent)

Approved By:

Sam Galloway 9/6/08 (Bechtel Site Superintendent)

REVIEWED 8/5/08 BY 

		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048		(Q or N) 	Boring No: B-342 Sheet 1 of 1	
		Boring Contractor: <u>Connelly & Associates</u> Boring Foreman: <u>Wes Wake</u> Drilling Methods: (see below) Drilling Equipment: Rig: <u>CME-550</u> Hammer Type: 140-lb Auto Rod Size: <u>AWJ</u> Schnabel Representative: <u>Ron Cepul</u> Dates Started: <u>7-31-08</u> Finished: <u>8-5-08</u> Location Northing: <u>217214.7</u> Easting: <u>960272.2</u> Ground Surface Elevation (ft): <u>16.0</u>					

Groundwater Observations					
(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					
Type of Reading*	Date	Depth	Casing	Caved	
Encountered (4:30 PM)	7-31-08	12.5'	13.0'	—	
Begin of Day (6:55 AM)	8-1-08	-1.3'	13.0'	—	
End of Day (2:00 PM)	8-1-08	-1.5'	13.0'	—	
Begin of Day (8:45 AM)	8-4-08	7.0'	13.0'	—	
End of Day (6:08 PM)	8-4-08	-0.5'	13.0'	—	
Begin of Day (7:00 AM)	8-5-08	13.0'	13.0'	—	
Completion (6:28 AM)	8-5-08	3.0'	13.0'	—	

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
START OF DAY / DRILLING 7-31-08 (4:24 PM) — 07-31-08					
S-1	17	14+2	0-1.5	16.0-15.5	6" of organics, root matter, & leaf matter (0.0-0.5 ft)
			0.5-1.5		POORLY GRADED SAND WITH SILT (SP-SM), med. sand, moist, orange brown, contains mica, no HCl reaction (with SM)
					4 1/4" ID HSA advancing between 0 and 2.5 ft, uniform resistance, cuttings orange brown sand with silt
S-2	18	14+3	2.5-4.0	73.5	POORLY GRADED SAND WITH SILT (SP-SM), med. sand; moist, orange brown, contains mica, no HCl reaction (with soil)

NOTE: NEGATIVE GROUNDWATER OBSERVATION DEPTH DENOTES WATER LEVEL READING ABOVE GROUND SURFACE (I.E. "NEGATIVE DEPTH") AND DOES NOT NECESSARILY IMPLY ARTESIAN CONDITIONS

8/5/08



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Q or N)

Q

Boring No: B-242

Sheet 2 of 4

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
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Material Unit Description / Drilling Method / Observations

					4-1/4" I.D. HSA advancing between 2.5 and 5.0 ft., uniform resistance, cuttings orangish brown poorly graded sand with silt
5-3	13	4-5/4	5.0-6.5	71.0	POORLY GRADED SAND WITH SILT (SP-SM), med. sand, moist, orangish brown, contains mica, no HCl reaction (with sat), homogeneous
					4-1/4" I.D. HSA advancing between 5.0 and 7.5 ft., uniform resistance, cuttings orangish brown poorly graded sand with silt.
5-4	18	5-5/2	7.5-9.0	68.5	IRON CEMENTED SAND BETWEEN 7.5 and 7.6 ft. 5- @ 24503 SAMPLED AS JAR #4 (7.5 to 8.4 ft) POORLY GRADED SAND WITH SILT (SP-SM), med sand, moist, orangish brown, contains mica, no HCl reaction (with sat).



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)
Q

Boring No. B-342
Sheet 3 of 44

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data
------------	------------	-----------------------

Depth Interval (ft)

Elev. (ft)

Material Unit Description / Drilling Method / Observations

SAMPLED AS TAP 4-B (8.4-9.0 ft)

CLAYEY SAND (SC), med. sand, moist, orangish brown and light gray, contains mica, no HCl reaction (with soil)

4 1/2" I.D. HSA advancing between 7.5 and 10.0 ft, uniform resistance, cuttings orangish brown clayey sand

CLAYEY SAND (SC), med. sand, moist, orangish brown and lt. gray, no HCl reaction (with soil)

4 1/2" I.D. HSA advancing between 10.0 and 12.5 ft, uniform resistance, cuttings orangish brown clayey sand



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

Q

Boring No: B-342

Sheet 4 of 44

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved
ENC 1C	7-31-08			

Testing / Sampling

Sample No.	Rea. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
------------	------------	-----------------------	---------------------	------------

Material Unit Description / Drilling Method / Observations

5-6	18	2-3-8	12.5-14.0	63.5	LEAN CLAY WITH HS AND (CL), moist, gray, contains mica, no HCl reaction (with soil), soft, homogeneous
			63.5		Groundwater encountered (12.5 ft depth), switch to mud rotary with 3 1/4" tricone roller bit END OF DAY 7-31-08 (6:15 PM) BEGIN OF DAY 8-1-08 (6:15 AM) 35 second drilling P.I. added to hole 3 1/4" roller bit advancing between 12.5 and 13.0 ft,

FIELD
BORING
LOGCCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

Q

Boring No: B-343Sheet 5 of 44

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading* Date Depth Casing Caved

Testing / Sampling

Sample No. Rec. (in.) Blow Counts / PP Data Depth Interval (ft) Elev. (ft)

Material Unit Description / Drilling Method / Observations

S-7 16 42+3 15.0-16.5 61.0

CLAYEY SAND (SC), f. to med.
sand, moist, gray, contains
mica, no HCl reaction (with soil)3 1/2" O.D. tricone roller bit
advancing between 15.0 and 18.5
ft, uniform resistance
drilling fluid brownish gray, c. 10%
clayey sand gray

S-8 18 24+3 18.5-20.0 57.5

STANDY LEAN CLAY (CL), f. sandy,
moist, gray, contains mica,
no HCl reaction (with soil),
soft, homogeneous

FIELD
BORING
LOGCCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

Q

Boring No: B-342

Sheet 6 of 11

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading* Date Depth Casing Caved

Testing / Sampling

Sample No. Rec. (In.) Blow Counts / PP Data

Depth Interval (ft)

Elev. (ft)

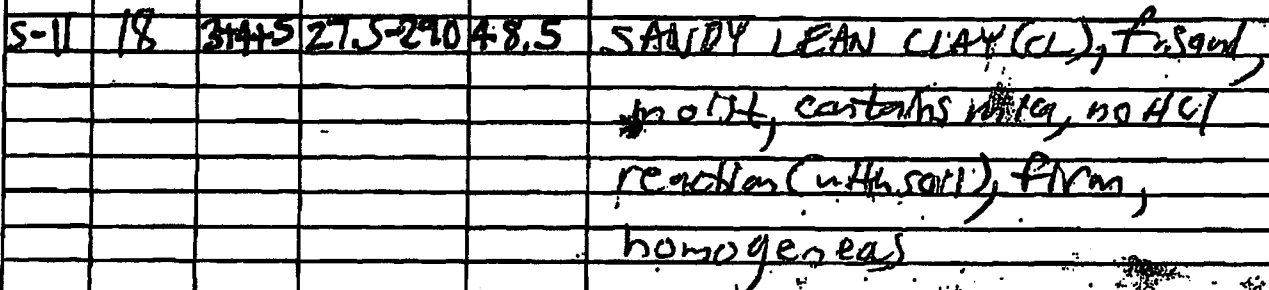
Material Unit Description / Drilling Method / Observations

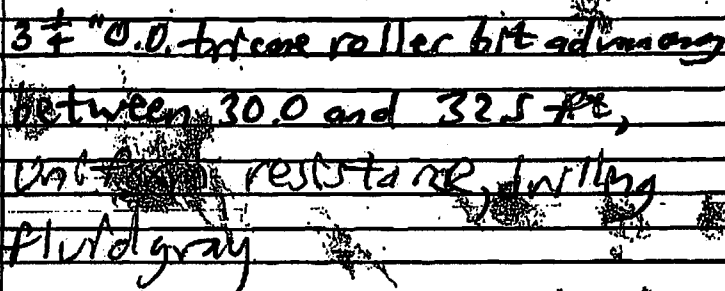
3 1/2" O.D. tricone roller bit

advancing between 18.5 and 23.5 ft,
uniform resistance, drilling fluid
gray

Sample No.	Rec. (In.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
5-9	19	3434	23.5250	52.5	SANDY LEAN CLAY (CL), f. sand, moist, gray, contains mica, no HCl reaction (with soil), silty sand layer from 24.5 to 24.6 ft

3 1/2" O.D. tricone roller bit
advancing between 23.5 and 25.0 ft,
uniform resistance, drilling
fluid gray





Sheet 9 of 44

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto **Rod Size:** _____

Schnabel Representative: _____

Dates Started: _____ **Finished:** _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft):

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

[illegible]

Testing / Sampling

Sample No.	Rec. (In.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
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Material Unit Description / Drilling Method / Observations

S-13	18	32.5-34.0	43.5	FAT CLAY WITH SAND (H), f.sand, moist, gray, contains mica, no HCl reaction (with soil), hard, homogeneous
				3 1/4" O.D. triane roller bit advancing between 32.5 and 35.0 ft, Uniform resistance, drilling fluid gray
S-14	18	35.0-36.5	41.0	STONY SAND (SA), f.sand, moist, gray, contains mica, no HCl reaction (with soil), homogeneous

Sheet 10 of 4

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto **Rod Size:** _____

Schnabel Representative: _____

Dates Started: _____ **Finished:** _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft):

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*

Date

Depth

Casing

Caved

Testing / Sampling

**Sample
No.**

Rec. (In.)

**Blow
Counts /
PP Data**

**Depth Interval
(ft)**Elev.
(ft)

Material Unit Description / Drilling Method / Observations

$3\frac{1}{4}''$ - tricone roller bit advancing
between 35.0 and 37.5 ft,
uniform resistance, drilling fluid
gray

5-15	R	549+13	37.5-390	38.5	SILTY SAND (SM), f. to med. sand, moist, gray; contains mica; no HCl reaction (with soft), homogeneous.
------	---	--------	----------	------	--

$3\frac{1}{4}$ " O.D. extreme roller bit advancing
between 37.5 and 40.0 ft,
uniform resistance, drilling
fluid gray



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

Q

Boring No: B-342

Sheet 11 of 14

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
------------	------------	-----------------------	---------------------	------------

Material Unit Description / Drilling Method / Observations

S-16 15 34.4 40.0-41.3 36.0

SAMPLED AS TAR 16A (40.0 to 40.5 ft)

SILTY SAND (SM), f. sand, moist

gray, contains mica, no HCl reaction (with soil)

SAMPLED AS TAR 16B (40.8 to 41.3 ft)

SILTY GRAVEL WITH SAND, gravel (subangular), moist, gray, contains mica, no HCl reaction (with soil), gravel cemented sand 3/4" O.D. torque roller bit advancing

between 40.0 and 42.5 ft.

uniform resistance 40.0-41.0 ft,

drilling hard 41.0-42.5 ft, drilling

fluid gray

S-17 18 32.6 42.5-44.0 33.5

POORLY GRADED SAND WITH

SILT (SP-SM), f. sand, moist

gray, est. 5-10% shells, highly

weathered shells, contains mica, weak HCl

reaction (with shells), no HCl

reaction (with soil)

Boring Contractor: _____

Boring Foreman:

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto **Rod Size:** _____

Schnabel Representative: _____

Date Started: _____ **Finished:** _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft):

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

[illegible]

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
					3 1/4" O.D. tricone roller bit advancing between 42.5 and 45.0 ft, uniform resistance, drilling fluid gray
5-18	16	9443 ^{9 1/4"}	45.0-46.3	31.0	POORLY GRADED SAND WITH SILT (SP-SM), f sand, moist, gray, est. 10-15% highly weathered shells (fragments), contains mKa, weak HCl reaction (with shells), weak no HCl reaction (with soil), laminated structure between 45.8 and 46.3 ft 3 1/4" O.D. tricone roller bit advancing between 45.0 and 47.5 ft, uniform resistance, drilling fluid / b gray



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Project No. 08120048

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Boring No: **B-342**

Sheet **13** of **14**

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
5-19-18	35.4	42	47.5-49.0	28.5

Material Unit Description / Drilling Method / Observations

POORLY GRADED SAND WITH SILT (SP-SM), f. sand, moist, gray, est. 5-10% highly weathered shells (fragments), contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)				
3 1/4" O.D. tricone roller bit advancing between 47.5 and 50.0 ft, uniform resistance, drilling fluid gray				
5-20-18	35.4	42	50.0-51.5	26.0
SAMPLED AT JAR 20A, 50.0 to 51.0 ft, POORLY GRADED SAND WITH SILT (SP-SM), f. to med. sand, wet, gray, est. 5-10% highly weathered shells (fragments), contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)				
SAMPLED AT JAR 20B, 51.0 to 51.5 ft, SANDY LEAM CLAY (CL), f. sand, moist, gray, est. 5-10% shells (fragments), weak HCl reaction (with shells), weak HCl reaction (with soil)				

[illegible]

 Schnabel Schnabel Engineering		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048	(Q or N) Q	Boring No: B-842 Sheet 15 of 44																																																							
Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____			<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="5" style="text-align: left; padding: 5px;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: left; padding: 5px;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="padding: 5px;">Type of Reading*</th> <th style="padding: 5px;">Date</th> <th style="padding: 5px;">Depth</th> <th style="padding: 5px;">Casing</th> <th style="padding: 5px;">Caved</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>			Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																								
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Type of Reading*	Date	Depth	Casing	Caved																																																								
Testing / Sampling		Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations																																																								
Sample No.	Rec. (in.)	Blow Counts / PP Date																																																										
5-22	18	4+4+5	SS.O-SGS	21.0	CLAYEY SAND(SC), f.sand, moist gray, contains shells (fragments), contains neg, weak HCl reaction (with shells), no HCl reaction (with soil) 3 1/4" O.D. tricone roller bit advancing between SS.O and 57.5 ft, uniform resistance, 81-90% fluid gray																																																							
5-23	18	3+4+6	57.5-S9.0	18.5	CLAYEY SAND(SC), f.sand, moist gray, contains shells (fragments), contains neg, weak HCl reaction (with shells), no HCl reaction (with soil)																																																							

[illegible]



FIELD
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Project No. 08120048

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Q

Boring No: B-342

Sheet 17 of 44

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
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Material Unit Description / Drilling Method / Observations

S-25 18 62.5-64.0 13.5

POORLY GRADED SAND WITH

SILT AND GRAVEL (SP-SM),

f. sand., f. gravel (subangular),

moist, gray, 15-25% gravel

the form of cemented sand, contains mica, contains shells (fragments), weak HCl reaction (with shell / no HCl reaction (with sand))

34" O.D. bit core roller bit was used between 62.5 and 65.0 ft, rod in hammer chatter between 63.5 and 64.5 ft, drilling fluid gray

S-26 18 65.0-66.5 11.0

POORLY GRADED SAND WITH SILT

(SP-SM), f. sand, moist, gray,

est. 15-25% highly weathered

shells (fragments), contains mica,

weak HCl reaction (with shells),

no HCl reaction (with sand)



Material Unit Description / Drilling Method / Observations

3 1/4" O.D. tri-cone roller bit advancing
between 67.5 and 70.0 ft.
uniform resistance, drilling
fluid gray



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Boring No: B-342
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Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved
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Testing / Sampling

Sample No.	Req. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
------------	------------	-----------------------	---------------------	------------

Material Unit Description / Drilling Method / Observations

S-28	18	510-11	70.0-71.5	6.0
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POORLY GRADED SAND WITH SILT (SP-SM), f. sand, moist, gray, est. 5-10% moderately weathered shells (fragments), contains mica, weak HCl reaction (with shellish, no HCl reaction (with silt))
3 1/4" O.D. tricone roller bit advancing between 70.0 and 72.5 ft, uniform resistance, drilling fluid gray; drilling became hard at 72.5 ft

S-29	4	50/4"	72.5-72.8	3.5
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SILTY GRAVEL WITH SAND (GM), subangular f. sandy moist gray, gravel consists of slightly to moderately weathered shell fragments, contains mica, weak HCl reaction (with shells)



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Boring No: B-342

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Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Drill Bit Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
					3 1/4" O.D. tricone roller bit advancing
					between 72.5 and 75.0 ft,
					DC 8-1-08
					Uniform resistance, & hard drilling
					from 72.5 to 74.0 ft, uniform
					resistance / smooth drilling from
					74.0 to 75.0 ft
5-30			75.0	1.0	END OF DAY, 8-1-08, 1:50 PM
					75.0 ft.
					START OF DAY, 8-4-08, 9:00 AM,
					75.0 FT.
5-30	18	4749	75.0-76.5	1.0	POORLY GRADED SAND with silt (SP-SM), f sand,
					wet, gray, contains shells (fragments), contains
					mica, weak HCl reaction (with shells), no
					HCl reaction (with soil)
					3 1/4" O.D. tricone roller bit
					advancing between 75.0 and 75.5 ft,
					Uniform resistance, drilling fluid
					gray

FIELD
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Project No. 08120048

(Q or N)

Boring No: B-343Sheet 21 of 44

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below) _____

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
------------	------------	-----------------------	---------------------	------------

Material Unit Description / Drilling Method / Observations

S-31	18	5446	77.5-79.0	-1.5	POORLY GRADED SAND WITH SILT (SP-SM), f sand, wet, contains water, no HCl reaction (with soil) 3 1/4" O.D. tri cone roller bit advancing between 77.5 and 80.0 ft, uniform resistance, drilling fluid gray
S-32	10	3454	80.0-81.5	-4.0	POORLY GRADED SAND WITH SILT (SP-SM), f sand, wet, contains water, no HCl reaction (with soil) 2 1/2" O.D. tri cone roller bit advancing between 80.0 and 82.5 ft, uniform resistance, drilling fluid gray



10/12/94



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Calvert County, Maryland
Project No. 06120048

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Boring No: B-342

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Boring Contractor: _____
Boring Foreman: _____
Drilling Methods: (see below) _____
Drilling Equipment: Rig: _____
Hammer Type: 140-lb Auto Rod Size: _____
Schnabel Representative: _____
Dates Started: _____ Finished: _____
Location Northing: _____
Easting: _____

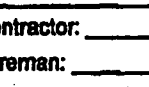
Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (n.)	Blow Counts / RP Data			
S-35	18	567-36	87.5-89.0	-11.5	POORLY GRADED SAND WITH SILT (SP-SM), med. sand, wet, gray, est 5-10% highly weathered shells (fragments), contains m/cn, weak HCl reaction (with shells), weak HCl reaction (with soil); layer of 1-b. gray cemented sands with shell fragments between 88.0 and 88.4 ft. 3 1/4" O.D. tricone roller bit advancing between 87.5 and 90.0 ft, mitary resistance drilling fluid gray between 87.5 and 88.0 ft, hard drilling 88.0-90.0 ft, drilling fluid gray
S-36	16	714-15	90-91.3	-14.0	POORLY GRADED SILTY SAND AND GRAVEL (SP-SM), f. med sand, gravel (subangular), wet, 1-b. gray, est. < 5% highly weathered

 Schnabel Engineering	FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048	(Q or N) <div style="font-size: 2em; text-align: center;">Q</div>	Boring No: B-343 Sheet 24 of 44
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="5" style="text-align: left;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: left;"><small>(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</small></th> </tr> <tr> <th>Type of Reading*</th> <th>Date</th> <th>Depth</th> <th>Casing</th> <th>Caved</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	Groundwater Observations					<small>(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</small>					Type of Reading*	Date	Depth	Casing	Caved																																																		
Groundwater Observations																																																																		
<small>(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</small>																																																																		
Type of Reading*	Date	Depth	Casing	Caved																																																														

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Res. (in.)	Blow Counts / PP Data			
					shells (fragments), contains mica, weak HCl reaction (with shells), no HCl reaction (with soil); gravel
					In sample consist of cemented sand pieces
					3/4" tricone roller bit advancing between 90.0 and 92.5 ft, hard drilling between 90.0 and 92.0 ft, easy drilling (break through had material) at 92.0 ft to 92.5 ft.
5-37	12	1750/6'	92.5 - 94.0 - 93.5	-16.5	POORLY GRADED SAND WITH SILT (SP-SM), f. to med. sand, wet, gray, est. 5-10% highly weathered shells (fragments), contains gravel (subangular), contains mica, weak HCl reaction (with shells), no HCl reaction (with soil); gravel consists of cemented sand pieces



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CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

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Boring No:

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Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below) _____

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading* Date Depth Casing Caved

Testing / Sampling

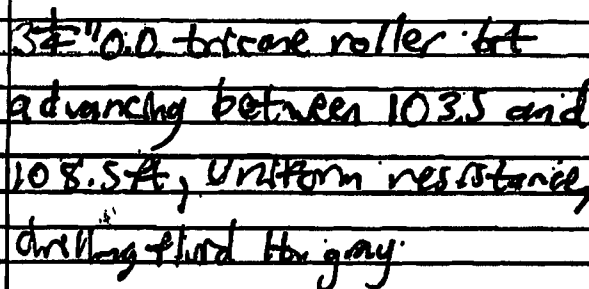
Sample No. Rec. (in.) Blow Counts / PP Date

Depth Interval (ft)

Elev. (ft)

Material Unit Description / Drilling Method / Observations

					3 1/2" O.D. tri cone roller bit advancing
					between 92.5 and 95.0 ft, uniform resistance, drilling fluid gray
					between 92.5 and 93.0 ft, had drilling between 93.0 and 94.5 ft, breakthrough of shell material between 94.5 and 95.0 ft, drilling fluid gray
5-38	18	3120/16	95.0-96.5	19.0	POORLY GRADED SAND WITH SILT (SP-SM), f. sand, wet, gray, est. <5% highly weathered shells (fragments), contains cemented sands, contains mica, weak HCl reaction (with shells), no HCl reaction (with sand)
					3 1/2" O.D. tri cone roller bit advancing between 95.0 and 98.5 ft, uniform resistance, drilling fluid gray
5-39	18	6411/13	98.5-100.0	22.5	POORLY GRADED SAND WITH SILT (SP-SM), f. sand, moist, gray, contains shells (fragments), contains



FIELD
BORING
LOGCCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

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Boring No: B-343

Sheet 27 of 44

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Req. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
------------	------------	-----------------------	---------------------	------------

S-41	18	54-14	108.5-110.0	-32.5
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Material Unit Description / Drilling Method / Observations

SILTY SAND (SM), f. sand, med, gray, contains highly weathered shells (fragments), contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)

3/4" O.D. bit and roller bit advancing between 108.5 and 113.5 ft, uniform resistance, drilling fluid H₂O gray

S-42	18	54-10	113.5-115.0	-37.5
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SILTY SAND (SM), f. sand, med, gray, contains shells (fragments), contains mica, weak HCl reaction (with shells), no HCl reaction (with soil)

Highly weathered shell inclusion from 114.4 to 114.5 ft

Sheet 28 of 44

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto **Rod Size:** _____

Schnabel Representative: _____

Dates Started: _____ **Finished:** _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft):

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*

Date

Depth

Casing

Caved

Testing / Sampling

**Samp
No.**

Rec. (In.)

**Blow
Counts /
PP Data**

**Depth Interval
(ft)**Elev.
(ft)

Material Unit Description / Drilling Method / Observations

$3\frac{1}{4}$ " O.D. tri-cone roller bit advancing
between 115.5 and 118.5 ft,
uniform resistance, drilling fluid:
Hb. gray

S-43	18	7+6+8	18.5 - 20.0	42.5
------	----	-------	-------------	------

POORLY GRADED SAND WITH
SILT (SP-SM), F. sand, wet,
gray, est. 5-10% highly weathered
shells (fragments), contains mica,
weak HCl reaction (with shells), weak
HCl reaction (with soil)

3 1/4" O.D. tricone roller bit advancing between 118.5 and 123.5 ft, uniform resistance, drilling plug gray



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BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)



Boring No: B-342

Sheet 27 of 44

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved
------------------	------	-------	--------	-------

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
------------	------------	-----------------------	---------------------	------------

Material Unit Description / Drilling Method / Observations

S-44	18	516+10	123.5-125.0	-47.5
------	----	--------	-------------	-------

SILTY SAND (SM), f. sand,
moist, gray, est 5-10%
highly weathered shells (fragments),
contains mica, weak HCl reaction
(with shells), no HCl reaction
(with soil)

3 1/2" O.D. tricone roller bit advancing
between 123.5 and 128.5 ft, uniform
resistance, drilling fluid gray

S-45	18	519+11	128.5-130.0	-52.5
------	----	--------	-------------	-------

SILTY SAND (SM), f. sand,
moist, gray, contains highly
weathered shells (fragments),
contains mica, weak HCl reaction
(with shells), weak HCl reaction
(with soil).



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

Boring No: 342

Sheet 2 of 4

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading* Date Depth Casing Caved

Testing / Sampling

Sample
No.

Rec. (in.)

Blow
Counts /
PP Data

Depth Interval
(ft)

Elev.
(ft)

Material Unit Description / Drilling Method / Observations

3 1/4" O.D. tricone roller bit
advancing between 128.5 and 133.5
ft, uniform resistance, drilling fluid
gray; no solid cuttings when sampled

S46 18 740-13 133.5-138.0 -57.5 SANDY SILT (ML), f. sand,
moist, gray, contains mica,
weak HCl reaction (with soil),
nonogeneous

3 1/4" O.D. tricone roller bit
advancing between 133.5 and
138.5 ft, uniform resistance,
drilling fluid gray

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
S-47	18	357	138.5-140.0	-62.5	SANDY SILT (ML), f. sand, mostly gray, est. <5% highly weathered shells (fragments), contains mica, weak HCl reaction (with shells), weak HCl reaction (with soil), hard 3 1/4" O.D. tdcme roller bit advancing between 138.5 and 143.5 ft. 138.5-140.0 Hard uniform resistance, drilling fluid gray
S-48	18	618	143.5-145.0	-62.5	SANDY SILT (ML), f. sand, mostly gray, contains shells (fragments), contains mica, weak HCl reaction (with shells), no HCl reaction (with soil), hard

Boring Contractor, _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto **Rod Size:** _____

Schubert Representative: _____

Dates Started: _____ **Finished:** _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft):

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved
------------------	------	-------	--------	-------

Testing / Sampling

**Depth Interval
(ft)**

Elev.
(ft)

Material Unit Description / Drilling Method / Observations

**Sample
No.**

Rec. (In.)

Blow Counts /

3/4" O.D. to case collar 6H.

advancing between 143.1 and 148.5 ft.; uniform resistance, drilling fluid gray

S-49	18	611	1485-150.0	-72.5	SANDY SILT (ML), f. sand, mod. brownish gray, contains irreg, weak HCl reaction (with soil)
------	----	-----	------------	-------	---

3 1/4" O.D. tri-cone roller bit
advancing between 148.5 and
153.5 ft; uniform resistance,
drilling fluid gray

moist, brownish gray, contains
inter, weak HCl reaction (with soil),
hard, homogeneous.



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

Q

Boring No: B-342

Sheet 34 of 44

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved
------------------	------	-------	--------	-------

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data
------------	------------	-----------------------

Depth Interval (ft)

Elev. (ft)

Material Unit Description / Drilling Method / Observations
--

3 1/2" O.D. tricone roller bit

advancing between 158.5 and 163.5 ft., uniform resistance, drilling fluid gray

END OF DAY, AUGUST 4, 2008 (6:00 AM)
163.5 ft

BEGIN OF DAY, AUGUST 5, 2008 (7:00 AM)
163.5 ft

552	18	799+1	163.5-165.0	-87.5	SANDY SILT (MC), f. sand, moist, brownish gray, contains mica, weak HCl reaction (with soil), hard, homogeneous
					3 1/2" O.D. tricone roller bit advancing between 163.5 and 168.5 ft., uniform resistance, drilling fluid gray

553	7	799+0	168.5-170.0	-92.5	SANDY SILT (MC), f. sand, moist, brownish gray, contains mica, weak HCl reaction (with soil), hard, homogeneous
-----	---	-------	-------------	-------	---



FIELD
BORING
LOG

CCNPP-Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

Q

Boring No: B-342

Sheet 35 of 41

Boring Contractor: _____
Boring Foreman: _____
Drilling Method: (see below) _____
Drilling Rig: _____
Rod Size: _____
Schnabel Representative: _____
Dates Started: _____ Finished: _____
Location Northing: _____
Easting: _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Ground Surface Elevation (ft): _____

Testing / Sampling

Sample No. Rec. (in.) Blow Counts / PP Data

Depth Interval (ft)

Elev. (ft)

Material Unit Description / Drilling Method / Observations

3 1/4" O.D. tricone roller btt advancing between 168.5 and 173.5 ft, uniform resistance, drilling fluid gray

S-34 18 S18H4 173.5-175.0 -97.5 SANDY SILT (ML), fine sand, mostly brownish gray, contains mica, weak KCl reaction (with soil), hard

3 1/4" O.D. tricone roller btt advancing between 173.5 and 178.5 ft, uniform resistance, drilling fluid gray

[illegible]

FIELD
BORING
LOGCCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

Q

Boring No: B-242
Sheet 38 of 44

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Reel (in.)	Blow Counts / PP Data	Depth (ft)	Elev. (ft)
------------	------------	-----------------------	------------	------------

S-58	18	4-7-13	193.5-195.0	-117.5
------	----	--------	-------------	--------

Material Unit Description / Drilling Method / Observations

POORLY GRADED SAND WITH SILT (SP-SM), f. to med. sand, wet, brownish gray, contains mica, no HCl reaction (with soil)

3 1/4" o.d. tire core roller bit advancing between 193.5 and 198.5 ft., uniform resistance, drilling fluid gray

S-59	18	4-16-11	198.5-200.0	-122.5
------	----	---------	-------------	--------

POORLY GRADED SAND WITH SILT (SP-SM), f. to med. sand, wet, gray, contains mica, no HCl reaction (with soil)

3 1/4" o.d. tire core roller bit advancing between 198.5 and 203.5 ft., uniform resistance,

(cont.)

S-6	18	5+41	20852100	-1323	SILTY SAND (SM), f. sand, moist, gray, contains mica, no HCl reaction (with soil)
-----	----	------	----------	-------	---



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Q or N)

Q

Boring No: B-342
Sheet 40 of 44

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved
------------------	------	-------	--------	-------

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
------------	------------	-----------------------	---------------------	------------

Material Unit Description / Drilling Method / Observations

3 1/2" O.D. tricone roller bit
advancing between 208.5 and
213.5 ft; Uniform resistance,
drilling fluid gray

S-62	18	619-122	13.5-215.0-137.5	SANDY SILT (ML); f. sand, moist, gray, contains mica, no HCl reaction (with soil), hard, homogeneous
------	----	---------	------------------	---

3 1/2" O.D. tricone roller bit advancing
between 213.5 and 218.5 ft,
uniform resistance, drilling fluid
gray; cuttings sandy silt
gray

Sheet 4 of 4

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto **Rod Size:** _____

Schnabel Representative: _____

Dates Started: _____ **Finished:** _____

Location Nothing: _____

Easting: _____

Ground Surface Elevation (ft):

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Point, Completion)¹

Type of Reading*

Date _____

Depth

Casino

Caved

Testing / Sampling

**Sample
No.**

Rec. (In.)

Blow Counts /

**Depth Interval
(ft)**Elev.
(ft)

Material Unit Description / Drilling Method / Observations

S-63

18

74019

2185-200

-1425

SANDY SILT (MU), f. sandy

moist, gray, contains water,
weak HCl reaction (with soil),
hard,
homogeneous

3 1/2" OD. tricone roller bit advancing
between 218.5 and 223.5 ft,
uniform resistance, drilling
fluid gray

5-64

18

61-8413

2235-2250

- 147.5

SANDY SILT (ML), f. sand,

moist, gray, contains mica,
weak HCl reaction (with soil),
hard, homogeneous



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

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Q

Boring No: B-342
Sheet 12 of 44

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Res. (in.)	Blow Counts / PP Date	Depth Interval (ft)	Elev. (ft)
------------	------------	-----------------------	---------------------	------------

Material Unit Description / Drilling Method / Observations

3 1/4" O.D. tricone roller bit advancing between 223.5 and 228.5 ft, uniform resistance, drilling fluid gray

S-65 18 7-10-13 228.5-230.0 -152.5

SANDY SILT (ML), f. sand, moist, brownish gray, contains mica, weak HCl reaction (with soil), hard, homogeneous

3 1/4" O.D. tricone roller bit advancing between 228.5 and 233.5 ft, uniform resistance, drilling fluid gray

FIELD
BORING
LOGCCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

Q

Boring No: B-342
Sheet 43 of 44

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved
------------------	------	-------	--------	-------

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data
------------	------------	-----------------------

Depth Interval (ft)

Elev. (ft)

Material Unit Description / Drilling Method / Observations

S-66	18	78+12	233.5-235.0	-157.5	SANDY SILT (ML), f. sand, moist, brownish gray, contains mica, weak HCl reaction (with soil), hard, homogeneous 3 1/2" o.d. tricone roller bit advancing between 233.5 and 238.5 ft, uniform resistance, drilling fluid gray
S-67	18	61+16	238.5-240.0	-162.5	SANDY SILT (ML), f. sand, moist, brownish gray, contains mica, weak HCl reaction (with soil), hard, homogeneous 3 1/2" o.d. tricone roller bit advancing between 238.5 and 243.5 ft, uniform resistance, drilling fluid gray

[illegible]

Test Boring Checklist

CCNPP 2006 Subsurface Investigation
Bechtel Job No. 25237
Schnabel Project No. 08120048

Test Boring No. B-343
Date: 7-25-08

7-31-08

Pre-Drill Check

Utility mark-out confirmed: Yes ☒ No ☐
Calibration of hammer verified: Yes ☒ No ☐
Location verified: Yes ☒ No ☐
Continuous sampling: 0 to 15 ft Yes ☒ No ☐
* Bottom 20 ft Yes ☒ No ☒
** Elevation +50 to -20 ft Yes ☒ No ☐
*** Entire Boring Yes ☒ No ☐

Notes:

(staked) - DC 7-8-08
GPS elevation at 832-ft,
approved offset location E
5 ft. plant well

Rock Size (circle one): A/W ☒ NW / NWJ / Other ☐

Pre-drill approval:

(signature/date)

Donald C. Gault Jr. 7-28-08
Sam Johnson 7/25/08

Drilling Check

Was water, mud, or casing necessary to maintain hole integrity per procedure TD17?

Yes ☒ No ☐ If yes, describe method used:

Mud rotary introduced at 14.0 ft, upon encountering groundwater

Split- spoon sampler correct size and in good condition? Yes ☒ No ☐
SPT's conducted in accordance with ASTM D1586? Yes ☒ No ☐
Thin-walled tubes correct size and in good condition? Yes ☒ No ☒ N/A
Samples labeled per procedure TD17? Yes ☒ No ☐
Borehole abandoned per procedure TD17? Yes ☐ No ☒ per 7/25/08

Drilling Summary

Describe drilling method(s) used: 4 1/2" TD HSA to 14.0 ft; 3 1/2" O.D. tri-cone

relied on from 14.0 to 250 ft.

Total depth of hole: 250.0 ft.

Drilling without sampling: N/A

No. cement bags for grouting: 0

No. UD samples: N/A

Deviations and Unusual Conditions

Prepared By:

Sam Johnson 7/31/08

(Schnabel Site Superintendent)

Approved By:

Sam Johnson 7/27/08

(Bechtel Site Superintendent)

REVIEWED 8/5/08 BY TH

Schnabel Geotechnical Engineering		FIELD BORING LOG	CONPP Subsurface Investigation Calvert County, Maryland Project No. 06120048		(S or N) Q	Boring No: B-34 Sheet 1 of 4
Boring Contractor: <u>Canaply Associates</u>			Groundwater Observations (Encountered, During Drilling, End of Day, Start of Day, Casing Filled, Completion)*			
Boring Foreman: <u>Wesley Wolfe</u>						
Drilling Method(s): (see below)						
Drilling Equipment Rig: <u>CME-550</u>						
Hammer Type: 140-lb Auto Rod Size: <u>AWJ</u>						
Schnabel Representative: <u>Don Cepul</u>						
Dates Started: <u>7/28/08</u> Finished: <u>7/29/08</u>						
Location Northing: <u>217039 +/-</u>						
Easting: <u>960306 +/-</u>						
Ground Surface Elevation (ft): <u>53.2 +/-</u>						
Testing / Sampling			Material Unit Description / Drilling Method / Observations			
Sample No.	Res. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)		
B-1	10	44	0-1.5	53.2	0-0.4 = Organics, roots, Manure matter = 60 pieces 5 inches; slight lighter color odor; poorly graded sand with fines (UC 7-8.5) SPT (SP-5H) / mostly orange brown, no HCl reaction (color soil) 4" and 1.5" HSA advancing between 0 and 2.5 ft, uniform resistance cuttings orange brown fine sand (SP-5H) with silt	
B-2	5	12-13	2.5-4.0	50.7	POORLY GRADED SAND with fines (UC 7-8.5) med. sand (SP-5H) / med. orange brown, no HCl reaction (color soil) 4" and 1.5" HSA advancing between and SPT, uniform resistance cuttings POORLY GRADED SAND with fines (SP-5H), orange brown	

*NOTE: NEGATIVE GROUNDWATER OBSERVATION DEPTH DENOTES WATER LEVEL READING ABOVE GROUND SURFACE (I.E. "NEGATIVE DEPTH") BUT DOES NOT NECESSARILY IMPLY ARTESIAN CONDITIONS

8/5/08



Material Unit Description / Drilling Method / Observations

6/2/54

Boring Contractor: _____
Boring Foreman: _____
Drilling Methods: (see below)
Drilling Equipment: Rig: _____
Hammer Type: 140-lb Auto Rod Size: _____
Schnabel Representative: _____
Dates Started: _____ Finished: _____
Location Northing: _____
Easting: _____



[illegible]

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Reas. (in.)	Blow Counts / PP Data			
S-4	15	2-34	7.5-9.0	75.7	POORLY GRADED SAND WITH SILT (SP-SM), med. sand, moist, orangish brown with white patches, no HCl reaction (with soil) 4 1/2" I.D. HSA advancing between 7.5 and 9.0 ft, uniform resistance, cuttings POORLY GRADED SAND WITH SILT, orangish brown
S-5	16	2-112	10-11.5	73.2	POORLY GRADED SAND WITH SILT (SP-SM), med. sand, moist, orangish-brown with white patches, no HCl reaction (with soil) 4 1/2" I.D. HSA advancing between 10.0 and 11.5 ft, uniform resistance, cuttings POORLY GRADED SAND WITH SILT

Western resistance culture **DIRTY GRASS** 2000
SELT SPAM, jangly, funny

 Schnabel Geotechnical Engineering			FIELD BORELOG LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. DB120048	(Q or M) Q	Boring No: B-343 Sheet 4 of 42																																																																	
Boring Contractor: _____ Boring Foreman: _____ Drilling Method(s) (see below): _____ Drilling Equipment Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____				<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="5" style="text-align:center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align:center;"><small>(Encountered, During Drilling, End of Day, Start of Day, Casing Filled, Sanitation)</small></th> </tr> <tr> <th>Type of Reading*</th> <th>Date</th> <th>Depth</th> <th>Casing</th> <th>Cased</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>			Groundwater Observations					<small>(Encountered, During Drilling, End of Day, Start of Day, Casing Filled, Sanitation)</small>					Type of Reading*	Date	Depth	Casing	Cased																																																		
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Testing / Sampling		Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations:																																																																			
Sample No.	Rms. (in.)						Slow Count / PP Data																																																																
6	18	12.5 - 14.0	70.7	<p>JAR LABELED AS S- @ B15/CB SAMPLED AS JAR 6A 12.5 - 14.0 FT.</p> <p>SILTY SAND (SM), med sand, moist, orange brown with whitish patches, no HCl reaction (with soil)</p> <p>JAR LABELED AS S- @ B15/CB SAMPLED AS JAR 6B 12.9 - 14.0 FT.</p> <p>POORLY GRADED SAND WITH SILT (SP-SM), med sand, moist, gray, contains mica, no HCl reaction (with soil)</p> <p>R 7-28 CB A-6" ID HSA advancing between 12.5 and 14.0 ft, uniform resistance, cuttings poorly graded sand with silt (SP-SM), orange brown</p>																																																																			
		14.0	-70.7	<p>Groundwater encountered at 14.0 ft @ B15/CB 3/4" O.D. TAYLOR POWER BIT (MOD RPT) switch to mud rotary; mild 1 1/2 bags of bentonite to 110 gals of water.</p>																																																																			

[illegible]

		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048	(1 of 1) 	Boring No: B-343 Sheet 6 of 12																																																		
Boring Contractor: _____ Boring Parameter: _____ Drilling Method: (see below) _____ Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____			Groundwater Observations (Specify Date, During Drilling, End of Day, Start of Day, During Pallet, Completion) <table border="1"> <thead> <tr> <th>Type of Reading</th> <th>Date</th> <th>Depth</th> <th>Casing</th> <th>Cased</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>			Type of Reading	Date	Depth	Casing	Cased																																													
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Testing / Sampling <table border="1"> <thead> <tr> <th>Sample No.</th> <th>Res. (ft.)</th> <th>Flow Counts / PP Data</th> </tr> </thead> <tbody> <tr> <td>5-8</td> <td>18</td> <td>144-5</td> </tr> </tbody> </table>		Sample No.	Res. (ft.)	Flow Counts / PP Data	5-8	18	144-5	Depth Interval (ft) 18.5-20.0	Elev. (ft) 64.7	Material Unit Description / Drilling Method / Observations JAR LABELED AS S- (18) 815/28 5-8 JAR LABELED AS JAR 8A (18.5-19.0 FT) LEAN CLAY WITH SAND (CL), f. sand, wet, gray, contains m/c, no HCl reaction with soil. 3 1/4" O.D. - tricone roller bit advancing between 18.5 and 22.5 ft SAMPLED AS JAR 8B (19.0-20.0 FT) JAR LABELED AS S- (18) 815/28 PARTLY GRAINED SAND WITH SILT "mca" (SPSM), f. sand, wet, gray, contains m/c, no HCl reaction (with soil)																																													
Sample No.	Res. (ft.)	Flow Counts / PP Data																																																					
5-8	18	144-5																																																					
5-9		23.5-26.0	59.7	3 1/4" O.D. - tricone roller bit advancing between 18.5 and 22.5 ft, uniform resistant, drilling fluid thickener SANDY LEAN CLAY (CL), f. sand, moist, gray, contains m/c, no HCl reaction (with soil)																																																			

Boring Contractor: _____
 Boring Foreman: _____
 Drilling Methods: (see below) _____
 Drilling Equipment: Rig: _____
 Hammer Type: 140-lb Auto Rod Size: _____
 Schnabel Representative: _____
 Date Started: _____ Finished: _____
 Location-Northing: _____
 Easting: _____
 Ground Surface Elevation (ft): _____

Groundwater Observations

(Encumbrance, During Drilling, End of Day, Start of Day, Costing Period, Completion)*

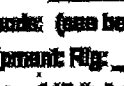

[illegible]

Testing / Sampling

Sample No.	Res. (n.)	Blow Counts PP. Data	Depth Interval (ft)	Elev. (ft)
S-11	1	1	32.5-34.0	90.7

[illegible]

31	19	34	32.5-34.0	50.7	LEAN CLAY WITH SAND (CL), F. sand, mostly gray, contains lenses, no HCl reaction (with salt), first, "lenses" of silty sand (0.1' thick) at 33.4 ft.
					4 1/2" O.D. bit core after bit advancing between 32.5 and 34.0 FT, uniform resistance, drilling fluid white.
32	18	45	35.0-36.5	48.2	LEAN CLAY WITH SAND (CL) F. sand, mostly gray, contains lenses, no HCl reaction (with salt), hard
					5 1/4" O.D. bit core after bit advancing between 35.0 and 36.5 FT, uniform resistance, drilling fluid white.

 Schnabel Environmental Services	FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 05120048	(2 of 2) 	Boring No: B-343 Sheet 1 of 1
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Boring Contractor: _____ Boring Foreman: _____ Drilling Method: (see below) _____ Drilling Equipment Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center;">(Equipment, During Drilling, End of Day, Start of Day, Casing Packed, Completion)</th> </tr> <tr> <th style="text-align: center;">Type of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Cased</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Equipment, During Drilling, End of Day, Start of Day, Casing Packed, Completion)					Type of Reading*	Date	Depth	Casing	Cased																																			
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(Equipment, During Drilling, End of Day, Start of Day, Casing Packed, Completion)																																																			
Type of Reading*	Date	Depth	Casing	Cased																																															

Testing / Sampling				Material Unit Description / Drilling Method / Observations	
Sample No.	Rpt. (ft.)	SNG Counts / PE Data	Depth Interval (ft)	Elev. (ft)	@ Elev.
513	16	1419	31.5-31.0	45.7	@ 45.6
LEAN CLAYEES, WITH S. SAND (CL)					
f. sand, moist, gray, contains mica, no HCl reaction with H ₂ O. A - extreme roller bit resistance between 37.5 and 40.0 ft., with no resistance, drilling fluid white					
hard					
514	18	5157	40.0-41.2	42.2	@ 42.1
MONEY SAND (C) - f. sand, moist, gray, contains mica, no HCl reaction with H ₂ O. A -					
52' O.A. - extreme roller bit resistance between 40.0 and 42.1 ft. uniform reaction, drilling fluid white					



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(1 of 1)
Q

Boring No. **B-343**
Sheet **10** of **12**

Boring Contractor:
Boring Foreman:
Drilling Method(s) (see below):
Drilling Equipment Rgr:
Hammer Type: 140-lb Auto Rod Size:
Schnabel Representative:
Dates Started: Finished:
Location Notes:
Easting:

Groundwater Observations

(Equipment, Pumping Device, Elevation, Start of Day, Casing Packed, Completed)

Type of Reading	Date	Depth	Casing	Correl

Ground Surface Elevation (ft):

Testing / Sampling	Depth Interval (ft)	Elev. (ft)
Sample No. / Date		

① B/S/28

Material Unit Description / Drilling Method / Observations

5-15	12.5-44.0	40.7	JAR LABELED JAR AS S-15A (42.5-43.0 ft)
			LSM CLAY WITH SAND (CL), f. med. moist,
			gray, contains m. iron, no HCl reaction (with soil), had
① B/S/28			JAR LABELED JAR AS S-15B (43.0-44.0 ft)
			GRADED SAND WITH SPT - 77
			GRADED SAND WITH SPT - 77
			gray, contains m. iron, no HCl reaction (with soil), had
			34" O.D. turbine roller bit & adv. rate
			from 42.5 and 43.0 ft, uniform
			resistance, drilling - 4 ft. per min.
5-16	18	43.0-46.5	38.2
			SLTLY SAND (SM), f. sand,
			moist, gray, contains m. iron,
			no HCl reaction (with soil)

[illegible]



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 00120048

(A or B)

Boring No: **B-343**
Sheet **1 of 2**

Boring Contractor: _____

Boring Foreman: _____

Drilling Method: (see below)

Drilling Equipment: Rig _____

Drill Bit Type: 140-lb Auto Rod Size: _____

Drilling Supervisor: _____

Date Started: _____ Finished: _____

Location: _____

Remarks: _____

Ground Surface Elevation (ft): _____

Drilling Method: _____

Drilling Method: _____

Drilling Method: _____

Drilling Method: _____

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Drilling Method: _____

Groundwater Observations

(Elevation, During Drilling, End of Day, Start of Day, Gauge Filled, Completed)

Type of Reading*	Date	Depth	Casing	Caved

Drilling Method: _____

Drilling Method: _____

Drilling Method: _____

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Material Unit Description / Drilling Method / Observations

Drilling Method: _____

Drilling Method: _____

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Drilling Method: _____

Drilling Method: _____

Drilling Method: _____

5 1/4" O.D. - tricone roller bit
advancing between 47.5 and 50.7 ft,
uniform resistance, drilling fluid flowing

POORLY GRADED SAND WITH CLAY
(SP-81), F. Sand, moist, gray
MCL (MCL-100) (MCL-100)
5 1/4" O.D. - tricone roller bit advancing
between 50.7 and 52.5 ft, uniform
resistance, drilling fluid flowing

POORLY GRADED SAND WITH CLAY
(SP-81), F. Sand, moist, gray, no
MCL (MCL-100) (MCL-100)

FIELD
BORING
LOGCCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Q or R)

Q

Boring No: B-343

Sheet 15 of 42

Boring Contractor:

Boring Foreman:

Drilling Methods: (see below)

Drilling Equipment: Rig:

Hammer Type: 140-lb Auto Rod Size:

Schnabel Representative:

Dates Started: Finished:

Location Northings:

Easting:

Ground Surface Elevation (ft):

Groundwater Observations

(Encased, During Drilling, End of Day, Start of Day, Casing Filled, Completion)

Type of Reading Date Depth Casing Cased

Testing / Sampling

Res. (in.)

Blow
Counts /
PP DataDepth Interval
(ft)Elev.
(ft)

Material Unit Description / Drilling Method / Observations

3 1/2" O.D. triaxial roller bit

advancing between 52.5 and 55.0 ft,

uniform resistance, drilling thru

16 in. gray

52.0 - 52.5 ft 55.0-56.5 28.2 POORLY GRADED SAND WITH SOME

(SP-SM), medium sand, coarse (angular)

wet, gray, est. 30-40% highly

weathered shells (fragments), containing

many sharp, flat, rounded (with shell), mottled

blackish (with shell) coarse sand and some

3 1/2" O.D. triaxial roller bit advancing

between 55.0 and 57.5 ft, uniform

resistance, drilling thru 16 in. gray

Schnabel Schnabel Engineering		FIELD BORING LOG	CONPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(Scale) Q	Boring No. B-343 Sheet 1 of 1																																													
Boring Contractor: Boring Foreman: Drilling Methods: (see below) Drilling Equipment Rig: Hammer Type: 140-lb Auto Rod Size: Schnabel Representative: Dates Started: Finished: Location Northing: Easting: Surface Elevation (ft):			Groundwater Observations (Encased, During Drilling, End of Day, Start of Day, Casing Piled, Completion) <table border="1"> <thead> <tr> <th>Type of Reading</th> <th>Date</th> <th>Depth</th> <th>Casing</th> <th>Cased</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>			Type of Reading	Date	Depth	Casing	Cased																																								
Type of Reading	Date	Depth	Casing	Cased																																														
Logging / Sampling		Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations																																														
Sample No.	Run (in.)			Blow Counts / PP Data																																														
S-21	1.5	20.6	57.5-59.0	25.7	TAP LABELED AS S-21A (S-21B) Material Unit Description / Drilling Method / Observations (57.5 to 57.6 ft) SAMPLED AS TAP 2 (S-21A): POORLY GRAINED SAND WITH SILT (SP-SM), med to c. sand, coarse (angular), wet, gray, est. 10-15% highly water-saturated (contains water) strong HCl reaction (with acid), weak HCl reaction (with soil) (57.8 to 59.0 ft)																																													
TAP LABELED AS S-21B (S-21C)					SAMPLED AS TAP 3 (S-21B): SANDY SILT (ML) f. sand, med to gray, contains water, no HCl reaction (with soil) 3 1/2" O.D. torque roller bit advancing between 57.5 and 60.0 ft., with resistance, drilling thru H. gray																																													
S-21	18	44.5	59.0-61.5	23.2	SANDY SILT (ML); f. sand, med to gray, contains water, weak HCl reaction (with soil)																																													

Ground Surface Elevation (ft):

10

SILEX SHALE (SM), wet, gray,
contains cemented sand fragments,
contains water, no HCl reaction
(effervescent), no HCl reaction (with
cemented sands)

FIELD
BORING
LOGCCNPP Surface Investigation
Calvert County, Maryland
Project No. 08120048

(1 of 1)

Q

Boring No: **S-343**Sheet **12 of 12**

Boring Contractor: _____

Boring Partner: _____

Drilling Method: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Noting: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encased, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)

Type of Reading*	Date	Depth	Casing	Cased

Testing / Sampling

Sample No.	Res. (ft.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
------------	------------	-----------------------	---------------------	------------

Material Unit Description / Drilling Method / Observations

					3 1/2" O.D. roller bit advancing
					between 65.0 and 67.5 ft, with
					Uniform, bit considerable resistance,
					drilling fluid gray
S-25	16	7740	67.5-69.0	15.7	POORLY GRADED SAND WITH
					SILT (SP-SM), f. to med. sand,
					wet, gray with whitish patches,
					est 15-25% shells (fragments), no H.C. shells
					(with soil)
					3 1/2" O.D. torque roller bit
					advancing between 67.5 and 70.0 ft,
					uniform resistance 67.5-69.5 ft, harder
S-26	16	41240	70.0-71.5	13.2	drilling 69.5-70.0 ft, drilling fluid gray
					SLT V SAND (SM), f. to med. sand,
					f. sand (subrounded) wet, gray,
					est 15-25% shells, highly polished
					(fragments), contains some small
					(with shells), no H.C. shells
					Gravelly sand layer at bottom

[illegible]

Schnabel
Geotechnical EngineeringFIELD
BORING
LOGCCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

Sheet

2

Boring No. B-343

Sheet 18 of 42

Boring Contractor:

Boring Foreman:

Drilling Methods: (see below)

Drilling Equipment: Rig:

Motor Type: 140-lb Auto Rod Size:

Schnabel Representative:

Dates Started: Finished:

Location: Mailing:

Easting:

Ground Surface Elevation (ft):

Testing Sampling

Sample No. Date Blot Counts & PP Date

Depth Interval (ft)

Elev. (ft)

Material Unit Description / Drilling Method / Observations

S-28 17 10/17/08 74.5-76.5 8.2

POORLY GRADED SAND WITH

SILT (SP-SM), f. sand, wet,

gray, 5-10% highly weathered shells

(fragments), contains n. top, weak RHC

reaction (with shells), no RHC reaction

(with soil)

3/4" O.D. torque roller bit

advancing between 7.0 and 11.5 ft,

uniform resistance, drilling fluid

ft. gray

S-29 18 10/17/08 77.5-79.0 5.7

POORLY GRADED SAND WITH

SILT (SP-SM), f. sand, wet, gray

est 15-25% highly weathered

(fragments), contains n. top, weak RHC

reaction (with shells), no RHC

reaction (with soil)



FIELD
SPRING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 00120048

(2 of 3)
Q

Boring No: B-348
Sheet 19 of 22

Boring Contractor: _____
Boring Foreman: _____
Drilling Methods: (see below) _____
Drilling Equipment: Rig: _____
Hammer Type: 140-lb Auto Rod Size: _____
Schnabel Representative: _____
Dates Started: _____ Finished: _____
Location Notation: _____
Easting: _____
Ground Surface Elevation (ft): _____

Groundwater Observations

(Specimen, During Drilling, End of Day, Start of Day, Casing Filled, Completion)

Type of Reading	Date	Depth	Casing	Cased

Testing / Sampling
Sample No. Depth (ft) Blow Counts (PP Data)

Material Unit Description / Drilling Method / Observations

					3 1/2" O.D. - tri-cone roller bit
					advancing between 77.5 and 80.0
					ft., uniform resistance, drilling fluid
					lt. gray
8-30	18	1458	80.0-81.5	3.2	POORLY GRADED SAND WITH
					SLT (SP-SM), slightly wet, gray,
					66.45% highly weathered sh
					(fragments), contains m/m, weak LAC
					regions (with sh), no HCl reaction (with acid)
					3 1/2" O.D. - tri-cone roller bit
					advancing between 80.0 and 82.0 ft.
					uniform resistance, drilling fluid
					lt. gray
8-31	18	5458	82.5-84.0	0.7	POORLY GRADED SAND WITH SLT
					(SP-SM), sand, wet, gray, contains
					highly weathered sh (fragments), contains
					m/m, weak LAC regions (with sh), no
					HCl reaction (with acid)



POORLY GRADED SAND WITH STEEL
(SP-5M), f. sand; wet, gray, contains highly
weathered shells (fragments), contains iron,
HCl reaction (with shells) no HCl
reaction (with silt), homogeneous

FIELD
BORING
LOGCCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Date)

Q

Boring No. B-343

Sheet 1 of 1

Boring Contractor:

Boring Foreman:

Drilling Methods: (see below)

Drilling Equipment: Rig:

Hammer Type: 140-lb Auto Rod Size:

Schnabel Representative:

Dates Started: Finished:

Location: Northing:

Easting:

Ground Surface Elevation (ft):

Groundwater Observations

(Elevation, During Drilling, End of Day, Start of Day, Spring Pulled, Completion)

Type of Reading* Date Depth Casing Cased

Testing / Sampling

Sample No. Depth (ft) Blow Counts / PP Date

Depth Interval (ft)

Elev. (ft)

Material Unit Description / Drilling Method / Observations

					3 1/2" O.D. bit case roller bit advancing between 87.5 and 90.0 ft; uniform resistance, drilling fluid Hg gray
S-34	18	3515	90.0-91.5	-0.8	POORLY GRADED SAND WITH S&T (SP-SM), pt. sand, wet, gray, contains highly weathered shells (fragments), contains mica, no HCl reaction (with shells), no HCl reaction (with soil)
					3 1/2" O.D. bit case roller bit advancing between 90 and 92.5 ft; uniform resistance, drilling fluid Hg gray
S-35	18	5103	92.5-94.0	-9.3	POORLY GRADED SAND WITH S&T (SP-SM), pt. sand, wet, gray with white streaks, 15-25% highly weathered shells (fragments), contains mica, strong HCl reaction (with shells), weak HCl reaction (with soil), shell lens at 93.5 ft

PCL
BORING
LOGCONPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(3 of 10)

Boring No: **R-343**Sheet **2 of 2**

Boring Contractor:

Boring Foreman:

Drilling Methods: (see below)

Drilling Equipment: Rig:

Hammer Type: 140-lb Auto Rod Size:

Schreiber Representative:

Dates Started: Finished:

Location Northings:

Eastings:

Ground Surface Elevation (ft):

Groundwater Observations

(Equipment, During Drilling, End of Day, Start of Day, Casing Filled, Completion)*

Type of Reading* Date Depth Casing Cased

Logging / Sampling

Sample No. Log (ft.) Blow Count PPL Data Depth Interval (ft.) Elev. (ft.)

Material Unit Description / Drilling Method / Observations

3 1/2" O.D. tricone roller bit

advancing between 92.5 ft

to 95.0 ft, uniform resistance,

drilling fluid H₂O gray

S-36 3 3 1/2" 95.0-95.4 -11.8

POORLY GRAINED SAND WITH

SILT (SP-SM), fr. to med. sand,

wet, H₂O gray, est R-25%

moderately to highly weathered,

shells (fragments), contains small

weak HCl reaction (with shell)

no HCl reaction (with soil)



3 1/2" O.D. tricone roller bit advancing

between 95.0 and 97.5 ft,

drilling fluid between 95.0 and 97.0

ft; drilling easy between

97.0 and 97.5 ft

		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(3 of 10) 	Boring No: B-343 Sheet 22 of 42																																													
Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schubel Representative: _____ Depth Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____			Groundwater Observations (Specify when, During Drilling, End of Day, Start of Day, Casing Filled, Completion) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Type of Reading</th> <th style="width: 15%;">Date</th> <th style="width: 15%;">Depth</th> <th style="width: 15%;">Casing</th> <th style="width: 25%;">Cased</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>			Type of Reading	Date	Depth	Casing	Cased																																								
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SP-5	5	30/5	100.0-104.0	-16.8	POORLY GRADED SAND WITH SILT (SP-SM), f. to med. sand, wet, gray, est. 3% highly weathered shells (fragments), contains gravel sized pieces of cemented sand, contains mica, weak HCl reaction (with shells), weak HCl reaction																																													



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

Q

Boring No: B-343
Sheet 2 of 2

Boring Contractor: _____
Boring Permit: _____
Drilling Methods: (see below)
Drilling Equipment: Rig: _____
Hammer Type: 140-lb Auto Rod Size: _____
Schnabel Representative: _____
Casing Started: _____ Finished: _____
Location Northing: _____
Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Observed, During Drilling, End of Day, Start of Day, Casing Filled, Completed)


Type of Reading	Date	Depth	Casing	Cased

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rep. (n)	Blow Counts & PP Data			
					3 1/2" O.D. tricone roller bit
					advancing between 100.0 and
					102.5 ft, drilling fluid between
					100.0 and 102.0 ft. 7-29-08
					102.0 and 102.5 ft, drilling fluid to gray
33	16	102.5-10.0-PL3			POORLY GRADED SAND WITH
					SILT (SP, SH), P. Sand, mostly
					gray, contains highly weathered shells
					(Glyptodonts), contains m/cn, weak HCL
					reactive (with shells), no HCL reaction with
					3 1/2" O.D. tricone roller bit advancing
					between 102.5 and 108.5 ft. Uniform
					resistance, drilling fluid to top
					END OF DAY, 7-29-08, 1000 AM
					START OF DAY, 7-30-08, 1000 AM
					50 second drilling fluid being used
					to start the day, as per Marsh
					Finish



Material Unit Description / Drilling Method / Observations

5-4	18	5040	1128-1150	-30.3	SEELY SAND (SM), f. sand, med. gray, contains mica, no HCl reaction (SMN soil), homogeneous
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		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(Q or R) <div style="font-size: 2em; font-weight: bold;">Q</div>	Boring No. B-343 Sheet 1 of 1
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) Drilling Equipment Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Date Started: _____ Finished: _____ Location Northings: _____ Eastings: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center; font-size: 0.8em;">(Equipment, During Drilling, End of Day, Start of Day, Casing Point, Completed)</th> </tr> <tr> <th style="text-align: center;">Type of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Cased</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Equipment, During Drilling, End of Day, Start of Day, Casing Point, Completed)					Type of Reading*	Date	Depth	Casing	Cased																																			
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Type of Reading*	Date	Depth	Casing	Cased																																															

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Res. (in.)	Blow Counts / PP Date			
					3 1/4" O.D. tricone roller bit
					advancing between 113.5 and
					118.5 ft, uniform resistance,
					drilling fluid lt. gray
S-42	18	77-10	113.5-120.0	-35.3	SILTY SAND (SM), f. sand,
					moist, gray, contains mica,
					no HCl reaction (with soil),
					homogeneous
					3 1/4" O.D. tricone roller bit
					advancing between 118.5 and 123.5
					ft, uniform resistance, drilling
					fluid lt. gray
S-43	18	60-11	123.5-130.0	-40.7	SILTY SAND (SM), f. sand,
					moist, gray, contains highly
					weathered shells (fragments), contains
					mica, weak HCl reaction (with shell),
					no HCl reaction (with soil)

[illegible]

FIELD
BORING
LOGCCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Scale)

Q

Boring No: B-343

Sheet 1 of 1

Boring Contractor: _____
Boring Foreman: _____
Drilling Method: (see below)
Drilling Equipment Rig: _____
Hammer Type: 140-lb Auto Rod Size: _____
Schnabel Representative: _____
Depth Started: _____ Finished: _____
Location North: _____
East: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Equipment, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)

Type of Reading*	Date	Depth	Casing	Level

Test / Sampling		Depth Interval (ft)	Elev. (ft)
No.	Box (ft.)		

Material Unit Description / Drilling Method / Observations

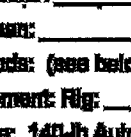

					3 1/2" O.D. bit cone roller bit advancing between 133.5 and 138.5 ft; uniform resistance, drilling fluid Hc. gray
18	GH3	138.5-140.0	-55.3		SANDY SILT (ML), f. sand, moist, gray, contains mica, weak HCl reaction (with soil), hard, homogeneous
					3 1/2" O.D. bit cone roller bit advancing between 138.5 and 143.5 ft; uniform resistance, drilling fluid Hc. gray
5-47	18	SH612	143.5-145.0	-60.7	SETTLE SAND (SM), f. sand, moist, gray, wt. < 5% highly weathered (fragments), contains mica, weak HCl reaction (with shell) and HCl reaction with soil

DC 7-30-08

DC 7-30-08

[illegible]

		FIELD BORE LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048		(G.M.) 	Boring No. B-343 Sheet 30 of 42																																								
Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment: Rig: _____ Hydraulic Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Bates Student: _____ Finished: _____ Location: Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____			Groundwater Observations (Exposures, During Drilling, End of Day, Start of Day, Casing Pulled, Completion) <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th style="width: 33%;">Type of Reading</th> <th style="width: 16%;">Date</th> <th style="width: 16%;">Depth</th> <th style="width: 16%;">Casing</th> <th style="width: 19%;">Gauged</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>				Type of Reading	Date	Depth	Casing	Gauged																																			
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Sample No.	Rep. (ft.)	Flow Counts	PR Data	Depth Interval (ft)	Elev. (ft)																																									

		FIELD BORING LOG	CENPP Subsurface Investigation Calvert County, Maryland Project No. 05120048	(Scale) 	Boring No: B-343 Sheet 81 of 12																																																							
Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____			<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="5" style="text-align: left; padding: 5px;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="font-size: small; text-align: left; padding: 2px;">(Expenditure, During Boring, End of Day, Start of Day, Casing Piled, Completion*)</th> </tr> <tr> <th style="width: 30%;">Type of Reading*</th> <th style="width: 15%;">Date</th> <th style="width: 15%;">Depth</th> <th style="width: 15%;">Casing</th> <th style="width: 25%;">Gauged</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>			Groundwater Observations					(Expenditure, During Boring, End of Day, Start of Day, Casing Piled, Completion*)					Type of Reading*	Date	Depth	Casing	Gauged																																								
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Sample No.	Rigs (in.)	Flow Control / PP Data																																																										
					3 1/2" O.D. tri-cone roller bit advancing between 158.5 and 163.5 ft., uniform resistance, drilling fluid gray																																																							
5-51	19	161+D	163.5-160	-80.3	SANDY SILT (CL), f. sandy, moist, gray, contains mica, weak HCl reaction, 7/10/88 at hard, homogeneous																																																							
					3 1/2" O.D. tri-cone roller bit advancing between 163.5 and 168.5 ft., Uniform resistance, drilling fluid gray																																																							

FIELD
BORING
LOGCGNPP Subsurface Investigation
Calvert County, Maryland
Project No. 86120048

Date

Boring No: B-343

Sheet 2 of 4

Boring Contractor: _____

Boring Foreman: _____

Drilling Method: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Going Failed, Completion)

Type of Reading* Date Depth Casing Cased

Testing / Sampling

Sample No. Res. (in.) Blow Counts / PP Data

Depth Interval (ft)

Elev. (ft)

Material Unit Description / Drilling Method / Observations

S-52 18 54H 168.5-173.0 -85.3

SANDY SILT (ML), f. sand, moist,
gray, contains mica, weak HCl
reaction (with soil), hard,
homogeneous.3 1/2" O.D. turbine roller bit
advancing between 168.5 and 173.5
ft, uniform resistance, drilling
fluid gray,

S-53 15 74H 173.5-180.0 -80.3

SANDY SILT (ML), f. sand,
moist, gray, contains mica,
weak HCl reaction (with soil),
hard, homogeneous.



Schnabel Engineering & Construction	Field Notes	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	10 of 10 Q	Boring No: B-343 Sheet 23 of 27
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Boring Contractor: _____
 Boring Foreman: _____
 Drilling Methods: (see below) _____
 Drilling Equipment Rtg: _____
 Hammer Type: 140-lb Auto Rod Size: _____
 Schnabel Representative: _____
 Dates Started: _____ Finished: _____
 Location Northing: _____
 Easting: _____

Groundwater Observations				
(Encountered, During Drilling, End of Day, Start of Day, Casing Point, Completion)				
Type of Reading*	Date	Depth	Casing	Cased

Ground Surface Elevation (ft): _____

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rep. (n.)	How Sampled / PP Data			
					3 1/2" O.D. tri-cone roller bit
					advancing between 173.5
					and 178.5 ft, uniform resistance,
					drilling fluid gray
5-54	15	6 PM	178.5-180.0	95.3	SANDY SILT (ML), f. sand,
					moist, gray, contains mica,
					weak HCl reaction (with soil),
					homogeneous
					3 1/2" O.D. tri-cone roller bit
					advancing between 178.5 and
					183.5 ft, uniform resistance,
					drilling fluid gray


		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(2 of 10) 	Boring No: <u>B-343</u> Sheet <u>1</u> of <u>4</u>																																																							
Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____			<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th style="text-align: center;">Time of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Gaging</th> <th style="text-align: center;">Gauged</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>			Groundwater Observations					Time of Reading*	Date	Depth	Gaging	Gauged																																													
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Sample No.	Res. (in.)	Blow Counts / PP Data																																																										
5-55	18	4-8-19	183.5-185.0	-100.3	SANDY SILT (ML), f. sand, moist, gray, contains mica, weak HCl reaction (with soil) homogeneous (see pg 7-3001)																																																							
					3 1/2" O.D. tri-cone roller bit advancing between 183.5 and 188.5 ft, uniform resistance, drilling fluid gray, cuttings sandy silty																																																							
5-56	18	6-9-12	188.5-190.0	-105.3	SANDY SILT (ML), f. sand, moist, gray, contains mica, weak HCl reaction (with soil), hard, homogeneous																																																							

		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048	(FORM) 	Boring No: B-343 Sheet 2 of 2
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Boring Contractor: Boring Form #1				Groundwater Observations				
Drilling Method(s): (see below)				(Prepared, During Drilling, End of Day, Start of Day, Closing Pulls, Completion)				
Drilling Equipment:				Type of Reading*	Date	Depth	Casing	Cased
Hammer Type: 14-lb. Anvil Rod Size:								
Schnabel Representative:								
Dates Started: Finished:								
Location:								
Grading Surface Elevation (ft):								

Testing / Sampling			Depth Interval	Elev.	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Bulk Sample / PP Data	(ft)	(ft)	
					3 1/2" O.D. tricone roller bit advancing between 188.5 and 193.5 ft., uniform resistance, drilling fluid gray
5-57-18	184.5		193.5 - 198	-110.3	POORLY GRADED SAND WITH SALT (SP-SH), F. to med. sand, moist, gray, est 5-10% moderately to highly weathered shells (fragments), contains mtn. weak chert nodules (with shell) no HC reaction (with roll)
					3 1/4" O.D. tricone roller bit advancing between 193.5 and 198.5 ft., uniform resistance, drilling fluid gray

[illegible]

		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	Boring No. B-343 Sheet 1 of 1																																													
Boring Contractor: _____ Boring Foreman: _____ Drilling Method: (see below) _____ Drilling Equipment: Rig _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Date Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____			Groundwater Observations <small>(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)</small> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Type of Reading*</th> <th>Date</th> <th>Depth</th> <th>Casing</th> <th>Cased</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>		Type of Reading*	Date	Depth	Casing	Cased																																								
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Testing / Sampling		Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations																																													
Sample No.	Res. (in.)	Blow Counts / PP Data																																															
					3 1/4" O.D. tri-cone roller bit																																												
					advancing between 203.5																																												
					and 208.5 ft, uniform																																												
					resistance, drilling fluid gray																																												
56018	1869	208.5-210.0	-125.3		POORLY GRADED SAND WITH																																												
					SILT (SP-SM), f. sand, moist																																												
					gray, contains mica, no H.C.																																												
					reaction (with soap)																																												
					3 1/4" O.D. tri-cone roller bit																																												
					advancing between 208.5																																												
					and 213.5 ft., uniform resistance																																												
					drilling fluid gray																																												
					213.5 ft																																												
					END OF DAY, 7-30-08, 208.5 ft																																												
					213.5 ft																																												
					BEGINNING OF DAY, 7-31-08, 208.5 ft																																												
					(7:40 AM)																																												



SILTY SAND (SM), f. sand
moist, gray, contains
weak HCl reaction (with soil)
homogeneous

[illegible]



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(1 of 3)



Boring No: **B-243**

Sheet **10** of **12**

Boring Contractor: _____
Boring Foreman: _____
Drilling Methods: (see below) _____
Drilling Equipment: Rig: _____
Hammer Type: 140-lb Auto Rod Size: _____
Schnabel Representative: _____
Dates Started: _____ Finished: _____
Location Name(s): _____
Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encased, Being Drilled, End of Day, Start of Day, Casing Piled, Completion)

Type of Reading*	Date	Depth	Casing	Cased

Testing / Sampling

Sample No.	Res. (in.)	Flow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
244	18	78-12	228.5-230.0	-16.3

Material Unit Description / Drilling Method / Observations

POORLY GRADED SAND WITH SILT (SP-SM), f. sand, moist, gray, contains mica, weak HCl reaction (with soil)

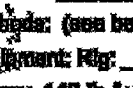
3 1/2" O.D. tricone roller bit advancing between 228.8 and 230.5 ft, uniform resistance, drilling fluid brownish gray

245	18	79-13	230.5-240.0	-10.3
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SILTY SAND (SM), f. sand, moist, gray, contains mica, no HCl reaction (with soil)



3 1/2" O.D. triane roller bit
advanced bet. 238' Sand
243-246, uniform resistance,
drilling fluid brownish gray

	FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048	(G or N) <div style="font-size: 2em; font-weight: bold;">Q</div>	Boring No. B-343 Sheet 1 of 1
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schubert Representative: _____ Dates: Start: _____ Finish: _____ Location: Northings: _____ Eastings: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center;">(Equipment, During Drilling, End of Day, Start of Day, Casing Filled, Completion)</th> </tr> <tr> <th style="text-align: center;">Type of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Cased</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Equipment, During Drilling, End of Day, Start of Day, Casing Filled, Completion)					Type of Reading*	Date	Depth	Casing	Cased																																								
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Type of Reading*	Date	Depth	Casing	Cased																																																				

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Res. (in.)	Blow Counts / PP Data			
S-47	18	58-13	2435-2450	-160.3	POORLY GRADED SAND WITH SILT (SP-SM), moist, brownish gray, contains mica, weak HCl reaction (with soil) homogeneous 3" - 4" cone roller bit advancing between 2435 and 2450 ft. Uniform resistance, drilling fluid brownish gray, no soil cuttings when sampled
S-48	18	58-13	2450-2500	-165.3	POORLY GRADED SAND WITH SILT (SP-SM), moist, brownish gray, contains mica, weak HCl reaction (with soil), homogeneous Boring terminated at 2500 ft. (1150 ft, 7-31-08) Boring grouted upon completion

Test Boring Checklist

CCNPP 2008 Subsurface Investigation
Bechtel Job No. 26237
Schnabel Project No. 09120048

Test Boring No. B-344

Date: 7-15-08

7-24-08

Pre-Drill Check

Utility mark-out confirmed: Yes ☒ No ☐
Calibration of hammer verified: Yes ☒ No ☐
Location verified: Yes ☒ No ☐
Continuous sampling: 0 to 15 ft Yes ☒ No ☐
* Bottom 20 ft Yes ☒ No ☒
** Elevation +80 to -20 ft Yes ☒ No ☐
*** Entire Boring Yes ☒ No ☐

Notes:

GPS verified elevation
at 72.3 ft.
Hammer verified as #2

Rod Size (circle one): AW ☒ NW ☐ Other ☐

Pre-drill approval:

REGULAR SPT SAMPLING
REMARKS: PHASE FOR PITCHER SAMPLING & PITCHER SAMPLING
(signature/date) Donald C. Galloway 7/15/08
Sam Galloway 7/15/08

Drilling Check

Was water, mud, or casing necessary to maintain hole integrity per procedure T01?

Yes ☒ No ☐ If yes, describe method used:

Mud Rotary method used from depth of 8.0 ft to completion of
boring at depth of 250.0 ft.

Split-spoon sampler correct size and in good condition? Yes ☒ No ☐
SPTs conducted in accordance with ASTM D1586? Yes ☒ No ☐
Thin-walled tubes correct size and in good condition? Yes ☒ No ☐
Samples labeled per procedure T01? Yes ☒ No ☐
Borehole abandoned per procedure T01? Yes ☒ No ☒

Drilling Summary

Describe drilling method(s) used: 6 1/4" USA to 8.0 ft, 3 1/2" O.D. tri-cone roller bit used to conduct SPT drilling (8-250.0 ft); 6 O.D. tri-cone roller bit used to ream (250.0 ft) at boring from 8.0 to 241.5 ft.
Total depth of hole: 250.0 ft
Drilling without sampling: N/A
No. cement bags for grouting: 10
No. UD samples: 9

Deviations and Unusual Conditions

By decree of Sam Galloway of Bechtel, Pitcher Tube Samples to be taken between depths 180.0 to 250.0 ft. (Galloway, 7-15-08)

Possible natural gas odor observed between 243.5 and 240.0 ft.

odor investigated with detector pen by Jimmy Meggs; no detected

Prepared By: DC (Schnabel Site Superintendent)

Signature / Date

Approved By: Sam Galloway 7/24/08 (Bechtel Site Superintendent)

Signature / Date

REVIEWED


7/29/08 by (S)

Schnabel Schnabel Engineering	FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(Q or R) Q	Boring No: B-34 Sheet 1 of 1
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Boring Contractor: Connelly	Groundwater Observations: 7/29/08
Boring Foreman: Wesley White	(Encountered, During Drilling, End of Day, Start of Day, Spacing Pulled, Completion)
Drilling Methods: (see below)	Type of Reading
Drilling Equipment: Rig: CME-SSD (S)	Date
Hammer Type: 140-lb Auto Rod Size: 1 1/2" / 1 1/4" (S)	Depth
Schnabel Representative: Don Cepell	Casing
Dates Started: 7-16-08 Finished: 7-29-08	Caved
Location Northing: 216976.8	
Easting: 960858.0	
Ground Surface Elevation (ft): 72.3	

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
					START OF DAY (7-16-08, 8:32 AM)
					7-16-08
2-11	14-1	10.0-1.5	72.3		(0.0-0.7) Litter, mostly decaying vegetation POORLY GRADED SAND WITH (SP-SM), f. to red sand, moist, Ht. brown, contains roots
					6" HSA Auger advancing between and 2.5 ft; uniform red sand cuttings Ht. brown
5-2	14	2.5-4.0	69.8		POORLY GRADED SAND (SP-SM), moist, c. sand (sub rounded), moist, Ht. brown contains gravel (small), fine

NOTE: NEGATIVE GROUNDWATER DEPTH DENOTES WATER LEVEL
ABOVE GROUNDWATER SURFACE (I.E. "NEGATIVE DEPTH")

	FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(Q or N) Q	Boring No: 344 Sheet 2 of 4

Boring Contractor: _____
 Boring Foreman: _____
 Drilling Methods: (see below)
 Drilling Equipment Rig: _____
 Hammer: 140-lb Auto Rod Size: _____
 Schnabel Representative: _____
 Dates: Started: _____ Finished: _____
 Location: Northing: _____
 Easting: _____
 Ground Surface Elevation (ft): _____

- Encountered Groundwater Observations: _____
 (Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Reinstalled)

Type of Reading	Date	Depth	Casing	Notes
Beginning of Day	7-21-08	16.0'	8.0'	
End of Day	7-21-08	8.0'	8.0'	
Beginning of Day	7-22-08	17.0'	8.0'	
End of Day	7-22-08	1.5'	8.0'	
Beginning of Day	7-23-08	17.0'	8.0'	
End of Day	7-23-08	8.0'	8.0'	
Beginning of Day	7-24-08	17.0'	8.0'	
End of Day	7-24-08	8.0'	8.0'	

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Test	Rec. (In.)	Blow Counts / PP Data			
					6 1/4" HSA Auger advancing between 2.5 and 5.0 ft, uniform resistance, color lt. brown
5-3	11	50-60 42-53	5.0-6.5	67.3	Clayey SAND (SC), f. to med sand, moist, lt. orange-brown, no ACI reaction (with soil), homogeneous
					6 1/4" HSA Auger advancing between 7.5 ft, uniform resistance, color lt. brown
8-4	17	24-22	7.5-9.0	64.8	(7.5-8.4 PT.) Sampled as jar 4A POORLY GRADED SAND, med to coarse CSP-SM, f. to med sand, moist orange-brown
					(8.4-9.0 PT.) Sampled as jar 4B DENSE CLAY, med to HSA PCKL, f. to med moist, lt. orange brown and lt. brown

	FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No: 06120048	(Q or N) 	Boring No: B-344 Sheet 1 of 1
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Boring Contractor: _____
 Boring Foreman: _____
 Drilling Methods: (see below)
 Drilling Equipment: Rig: _____
 Hammer Type: 140-lb Auto Rod Size: _____
 Schnabel Representative: _____
 Dates Started: _____ Finished: _____
 Location Northing: _____
 Easting: _____
 Ground Surface Elevation (ft): _____

Groundwater Observations				
(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)				
Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Res. (in.)	Blow Counts / PP Data			
					no HCl reaction (with soil), v. soft
					6 3/4" HSA Auger advanced to 10.0 ft
					the depth at which groundwater
					was encountered - switch to
					mud rotary with 3 1/4" O.D. roller bit
					March 1st - 1st run taken 7/19/08
					4.5 second mud added to
					drilling fluid; 3 1/4" O.D. tri-cone roller
					bit advancing between 7.5 and 10.0 ft
					uniform resistance, mud 16 brown
5-5	18	24313	10-11.5	62.3	LEAN CLAY WITH SAND (CL), f. sand,
					moist, gray, contains n/cu, no HCl
					reaction (with soil), soft
					3 1/4" O.D. tri-cone roller bit advancing
					between 10.0 and 12.5 ft. uniform
					resistance, mud 16 brown

Schnabel
Engineering

FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Q or N)

Q

Boring No: **B-344**

Sheet **4** of **4**

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rig: _____

Hammer type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encumbered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Res. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
5-6	18	3124	12.5-14.0	57.8	LEAN CLAY (CL) with SAND, f. sand, moist, gray, contains mica, no HCl reaction (with soil), firm, 0.5" layer of silty SAND between 12.0' and 13.14'.
					3 1/4" O.D. torque roller bit
					advancing between 12.5 and 15.0 ft,
					uniform resistance, mud H. brown
					Mud changed to gray at 15.0 ft.
5-7	18	3134	15.0-16.5	57.3	LEAN CLAY with SAND (CL), f. sand, moist, gray, contains mica, no HCl reaction (with soil), firm.
					3 1/4" O.D. torque roller bit
					advancing between 15.0 and 16.5 ft,
					uniform resistance, mud (drilling fluid) H. gray

Schnabel

Geotechnical Engineering

FIELD
BORING
LOGCCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

Q

Boring No. **B-344**Sheet **5 of 4**

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Representative: _____

Boring Started: _____ Finished: _____

Boring Location: _____

Boring: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Filled, Completion)

Type of Reading* Date Depth Casing Cased

Testing / Sampling

Sample No. Rod (in.) Blow Counts / PP Data

Depth Interval (ft)

Elev. (ft)

Material Unit Description / Drilling Method / Observations

7/27/08

S-8 19 4-10-11 18.5-20.0 53.8

18.5-19.2 ft. labeled as S-8A

LEAN CLAY WITH SAND (CL),

fine (UC 7-16-00) sand, no HCl reaction (with soil), v. firm

3 1/2" O.D. bit/case roller bit

advancing between 18.5 and 22.5 ft.

19.2-20.0 ft. labeled as S-8B

POORLY GRADED SAND WITH

SILT (SP-SM), f. sand, no HCl reaction

gray, contains mica, no HCl reaction

(with soil)

3 1/2" O.D. bit/case roller bit

advancing between 18.5 and 22.5 ft.

uniform resistance, drilling fluid H. gray



LEAN CLAY WITH SAND (CL),
f. sand, moist, gray; no HCl reaction
Cutt soil, veg; hard, homogeneous
7-16-08

FIELD
BORING
LOGCCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Per N)

Boring No. **B-344**Sheet **7** of **44**

Boring Contractor:

Boring Foreman:

Drilling Methods: (see below)

Drilling Equipment: Rig:

Hammer Type: 140-lb Auto Rod Size:

Schnabel Representative:

Dates Started: Finished:

Location Nothing:

Easting:

Ground Surface Elevation (ft):

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)

Type of Reading* Date Depth Casing Cased

Testing / Sampling

Sample No. Res. (in.) Blow Counts / PP Data Depth Interval (ft) Elev. (ft)

7/24/08

Material Unit Description / Drilling Method / Observations

5.0 feet) switched to 3/4" tri-cone roller bit,

3/4" O.D. tri-cone roller bit advancing

between 25.0 ft + 27.5 ft,

uniform resistance, mud Hg gray

S-1 16 7-78 27.5-31.0 44.8

SILTY SAND (SM), f. sand,

moist, gray, no HCl reaction (with soil),
homogeneous

3/4" O.D. tri-cone roller bit advancing

between 27.5 and 30.0 ft, uniform

resistance, drilling fluid Hg gray

S-2 18 214-19 30.0-31.5 42.3

SILTY SAND (SM), f. sand, moist,

gray, contains mica, no HCl reaction
(with soil), homogeneous



FIELD
BORING
LOG

OENPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(A & B)



Boring No: **B-344**

Sheet **8** of **11**

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)

Type of Reading*	Date	Depth	Casing	Caved
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Testing / Sampling

Sample No.	Rea. (in.)	Blow Counts / PP Data
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Depth Interval (ft)

Elev. (ft)

Material Unit Description / Drilling Method / Observations

3 1/4" O.D. bit/case roller bit advancing between 30.0 and 32.5 ft. with some resistance, drilling fluid is gray

S-13 18 9-11-2000 32.5-34.0

39.8

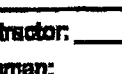
POORLY GRADED SAND with SPT (SP-SM), f. sand, mostly gray, contains mica, no HCl reaction (with 10% HCl), homogeneous

3 1/4" O.D. bit/case roller bit advancing between 32.5 and 35.0 ft, slightly more resistance between 34.0 and 35.0 ft, drilling fluid is gray

S-14 18 3-18-2000 35.0-35

37.3

POORLY GRADED SAND with SPT (SP-SM); f. sand, mostly gray, 5-10% highly reflective mica, contains mica, no HCl reaction (with 10% HCl), weak reaction (with 10% HCl)

 Schnabel Schnabel Engineering	FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(Q or N) Q	Boring No: R-344 Sheet 7 of 14
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="5" style="text-align: left; padding: 5px;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: left; font-size: small; padding: 5px;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="width: 20%;">Type of Reading*</th> <th style="width: 15%;">Date</th> <th style="width: 15%;">Depth</th> <th style="width: 15%;">Casing</th> <th style="width: 35%;">Caved</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																								
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Type of Reading*	Date	Depth	Casing	Caved																																																				

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (In.)	Blow Counts / PP Data			
					3 1/2" O.D. tricone roller bit advancing between 35.0 and 37.5 ft. Uniform resistance, drilling fluid lg gray
5-15	6	50/6"	37.5-38.0	34.8	Poorly GRADED SAND WITH S&G (SP-SM), f.sand, moist, gray, no HCl reaction (with soil)
					3 1/2" O.D. tricone roller bit advancing between 37.5 & 40.0 ft., uniform resistance, drilling fluid lg gray
8-16	11	200/5"	40.0-40.9	32.3	POORLY GRADED SAND WITH S&G + (SP-SM), f.sand, wet, gray, no HCl reaction (with soil)

Schnabel Schnabel Engineering			FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(Q or N) Q	Boring No: B-344 Sheet 10 of 10																																								
Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____					<p style="text-align: center;">Groundwater Observations</p> <p style="text-align: center; font-size: small;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Type of Reading*</th> <th>Date</th> <th>Depth</th> <th>Casing</th> <th>Caved</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>		Type of Reading*	Date	Depth	Casing	Caved																																			
Type of Reading*	Date	Depth	Casing	Caved																																										
Testing / Sampling			Material Unit Description / Drilling Method / Observations																																											
Sample No.	Res. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)																																										
					3 1/4" O.D. tricone roller bit advancing between 40.0 and 42.5 ft,																																									
					uniform resistance, med dk gray																																									
5-17	15	332240	42.5-44.0	29.8	WELL GRADED SAND WITH S&G (SW-SM), f. to c sand, subangular, med, gray with speckles of white, contains mte 15-25% highly carbaceous shells (fragments), weak HCl reaction (with shells)																																									
					no HCL —																																									
					3 1/4" O.D. tricone roller bit advancing between 42.5 and 45.0 ft,																																									
					uniform resistance, drilling fluid dk gray																																									
5-18	18	81443	45.0-46.5	27.3	WELL GRADED SAND WITH S&G (SW-SM), f. to c sand, subangular, wet, gray with bands of white, contains mte 15-25% highly carbaceous shells (fragments), no HCl reaction (with shells), weak HCl reaction (with shells)																																									

Schnabel Schnabel Engineering		FIELD BORING LOG		CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048		(Q or N) Q		Boring No.: B-344 Sheet 11 of 14		
Boring Contractor: _____						Groundwater Observations				
Boring Foreman: _____						(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*				
Drilling Methods: (see below)						Type of Reading*	Date	Depth	Casing	Caved
Drilling Equipment Rig: _____										
Hammer Type: 140-lb Auto Rod Size: _____										
Schnabel Representative: _____										
Dates Started: _____ Finished: _____										
Location Northing: _____										
Easting: _____										
Ground Surface Elevation (ft): _____										
Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations					
Sample No.	Rec. (in.)	Blow Counts / PP Data								
					3 1/4" O.D. tricone roller bit advancing between 45.0 and 47.5 ft; uniform resistance, drilling fluid Hg gray					
S-16	345.5	47.5-49.0	24.8		SANDY SILT (ML), f. sand, moist, gray, contains mica, no HCl reaction (with soil), firm, highly weathered shell fragments (fragments) at 48.2 ft.					
					3 1/4" O.D. tricone roller bit advancing between 47.5 and 50.0 ft, uniform resistance, drilling fluid Hg gray					
S-20	344.0	50.0-51.5	22.3		SANDY SILT (ML), f. sand, moist, gray, contains shells (fragments), contains mica, no HCl reaction (with soil), no HCl reaction (with shell), firm					



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CCNPP Subsurface Investigation
Calvert County, Maryland
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Boring No: B-344

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Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rod. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
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Material Unit Description / Drilling Method / Observations

3 1/4" O.D. tricone roller bit, advancing between 52.0 and 52.8 ft, uniform resistance, mud Hg gray, rod chatter 52.0-52.8 ft.

SSA / 7-16-08
52.1 11 12.5 / 52.5-53.0 19.8 SANDY SILT (ML), f. sand, moist, gray, contains mica, no HCl reaction with soil, 0.1' layer of fine cement sand at 53.1 ft.

3 1/4" O.D. tricone roller bit, advancing between 52.5 and 53.0 ft; rod chatter entire interval.

7-16-08
53.0-53.5 17.3 New batch of "45 second" drilling fluid

mixed for hole, marsh funnel taken 45 sec drilling fluid 7/27/08

End of Day 7-16-08 (6:10 PM)

Start of Day 7-17-08 (7:30 AM)

Mud (drilling fluid) evaluated at beginning of drilling - 58 second value via Marsh funnel

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Boring No: B-344
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Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
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Material Unit Description / Drilling Method / Observations

S-22	18	156-7	55.0-56.5	17.3	POORLY GRADED SAND WITH SILT (SM), f. sand, wet, gray, est. 5-10% shells (fragments), contains mica, no HCl reaction (with HCl), weak HCl reaction with shell (S-23), 5' of bitumens roller bit encountered between 55.0 and 57.5 FT, no HCl resistance, drilling fluid to gray
S-23	18	413-43	57.5-59.0	14.8	SAND & GRAVEL (H) 7/29/08 SILTY GRAVEL WITH GRAVEL (H) 7/29/08 (SM), f. sand, f. gravel (subangular), wet, gray, contains mica, (f. gravel sized), est. 15-25% shells (fragments), highly weathered, no HCl reaction (with HCl), weak HCl reaction with shell (S-22) *GRAVEL in this sample consists of shell fragments (H) 7/29/08



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Boring No: B-344

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Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rtg: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion*)

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (In.)	Blow Counts / PP Data			
					3 1/4" O.D. tricone roller bit
					advancing between 57.5 and 60.0
					ft, Uniform resistance, mud H.
					gray
S24	18	74+4	60.0-61.5	12.3	POORLY GRADED SAND WITH
					SILT (SP-SM), f. sand, wet, gray,
					est. 5-10% highly weathered shell fragments,
					contains mica, weak HCl reaction (with soil),
					no HCl reaction (with soil)
					3 1/4" O.D. tricone roller bit advancing
					between 60.0 and 62.5 ft., uniform
					resistance, drilling fluid H. gray
S25	18	45+5	62.5-64.0	9.8	POORLY GRADED SAND WITH SILT
					(SP-SM), m. f. sand, moist, gray,
					est. 5-10% highly weathered shell fragments,
					contains mica, no HCl reaction (with soil), weak HCl
					reaction (with soil), 0.1 inch fragments
					at 62.8 and 63.2 ft

layers



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Boring No: B-344

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Boring Contractor: _____
Boring Foreman: _____
Drilling Methods: (see below) _____
Drilling Equipment Rig: _____
Hammer Type: 140-lb Auto Rod Size: _____
Schnabel Representative: _____
Dates Started: _____ Finished: _____
Location Northing: _____
Easting: _____
Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rea. (n.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
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Material Unit Description / Drilling Method / Observations

3 1/4" O.D. bit cone roller bit advancing between 62.5 and 65.0 ft, uniform resistance, drilling fluid H₂O gray

5-26 18 5819 650-66.5 7.3

POORLY GRADED SAND WITH SCL (CL-SM), f. sand, moist, gray (cat) and white (shells), est 15-25% shells (largest) in form of inclusions, cat (sh) n/a no H₂O (with shell), weak (cl) (with shells) - 7-1208

3 1/4" O.D. bit cone roller bit advancing between 65.0 and 67.0 ft, uniform resistance, harder drilling from 67.0 to 67.5 ft, drilling fluid H₂O gray

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rtg: _____

Hammer Type: 140-lb Auto **Rod Size:** _____

Schnabel Representative: _____

Date Started: _____ **Finished:** _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

[illegible]

Testing / Sampling

Sample No.	Rss. (n.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
5-21	18	515-7	67.5-69.0	4.8	POORLY GRADED SAND WITH SFL (SP-SM), f. sand, wet, gray, est. < 5% whitish, highly weathered shells (fragments), no HCl reaction (with shells, no HCl reaction (with soil))
					3 1/2" OD. bi-cone roller bit advancing between 67.5 and 70.0 ft, uniform resistance, drilling fluid rising
5-28	18	515-18	70-76.5	2.3	POORLY GRADED SAND WITH SFL (SP-SM) f sand, wet, gray, contains shells fragments, no HCl reaction (with shells), no HCl reaction (with soil)



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Boring No: **B-344**
Sheet **17** of **44**

Drilling Contractor: _____
Drilling Foreman: _____
Drilling Methods: (see below)
Drilling Equipment: Rig: _____
Hammer Type: 140-lb Auto Rod Size: _____
Schnabel Representative: _____
Dates Started: _____ Finished: _____
Location Northing: _____
Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion*)

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Reco. (in.)	Blow Counts / PP Data			
					3 1/4" O.D. - tri-cone roller bit advancing
					between 70 and 72.5 ft, uniform
					resistance, med Hg gray
					-0.2
S-29	18	4+4+5	72.5-74.0	-0.5	POORLY GRAINED SAND WITH SILT (SP-SM);
					f. sand, wet, gray, contains shells
					(fragments), no HCl reaction (with
					sand), weak HCl reaction (with shells)
					3 1/4" O.D. - tri-cone roller bit advancing
					between 72.5 and 75.0 ft, uniform
					resistance, med Hg gray
S-30	18	4+4+5	75.0-76.5	-2.7	POORLY GRAINED SAND WITH SILT
					(SP-SM), f. sand, wet, gray, contains
					shells (fragments), no HCl reaction,
					(with sand), no HCl reaction (with shells)

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Boring No: B-344

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Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion*)

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Res. (ft.)	Blow Counts / PP Data			
					3 1/4" O.D. tricone roller bit advancing between 75.0 and 77.5 ft, uniform resistance, med. H ₂ gray
S-31	17	3444	75.0-77.0	-5.2	POORLY GRADED SAND WITH S&T (SP&M), f. sand, wet, gray, contains shells (fragments), no HCl reaction (with soil), no HCl reaction (with shells) 3 1/4" O.D. tricone roller bit advancing between 77.5 and 80.0 ft, uniform resistance, med. H ₂ gray
S-32	18	5741	80.0-81.5	-7.7	POORLY GRADED SAND WITH S&T (SP&M), f. sand, wet, gray, est. 5-10% shells (fragments), no HCl reaction (with soil), weak HCl reaction (with shells), shells oriented @ 75° to 90° to borehole thick shell layer @ 80.0 ft.

Boring Contractor: _____
Boring Foreman: _____
Drilling Method: (see below) _____
Drilling Equipment: Rig: _____
Hammer Type: 140-lb Auto Rod Size: _____
Schnabel Representative: _____
Date Started: _____ Finished: _____
Location Northing: _____
Easting: _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

[illegible]

Ground Surface Elevation (ft):

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Res. (in.)	Blow Counts / PP Data			
					3 1/2" O.D. tri-cone roller btt advancing between 80.0 and 82.5 ft, uniform resistance, drilling fluid Hg gray
5-33	12	14-9/16	82.5 - 10.2		POORLY GRADED SAND WITH S&B AND GRAVEL (SP-SM), F-sand, f-gravel (Schmager), wet, Hg gray, 15-25% shells (Ragwort), weathered reaction (with soil), wet, R-sand, gravel consists of highly weathered shell fragments 3 1/2" O.D. tri-cone roller advancing between 82.5 and 85.0 ft, drilling from 83.0 to 85.0 ft, Hg gray POORLY GRADED SAND AND GRAVEL (SP-SM), F-sand, f-gravel (Schmager), wet, Hg gray, 15-25% shells (Ragwort), weathered reaction (with soil) no HCl reaction (with soil) gravel consists of highly weathered shell fragments
5-34	18	13-7/16	85.0 - 86.5	-12.7	POORLY GRADED SAND AND GRAVEL (SP-SM), F-sand, f-gravel (Schmager), wet, Hg gray, 15-25% shells (Ragwort), weathered reaction (with soil) no HCl reaction (with soil) gravel consists of highly weathered shell fragments



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CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

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Boring No. **B-344**

Sheet **20** of **24**

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Res. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
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Material Unit Description / Drilling Method / Observations

3 1/4" O.D. tricone roller bit advancing between 85.0 and 87.5 FT, uniform resistance, drilling fluid H₂O gray

S-35 18 14323 87.5-89.0 -15.2 POORLY GRADED SAND WITH STORM CORALS (1900)

(11/19/08)

(11/19/08)

R sand, ~~fine to medium~~ wet, gray, (11/29/08) (highly to moderately weathered)

85-15-25% shells (fragments), contains weak, no HCl reaction (with soil), weak HCl reaction (with shells), gravel consists of highly to moderately weathered shell fragments (11/29/08)

3 1/4" O.D. tricone roller bit advancing

between 87.5 and 90.0 FT, uniform resistance, drilling fluid H₂O gray

S-36 18 91212 90.0-91.5 -17.7 SILTY SAND (SM), R sand;

wet, gray, contains shells (highly weathered fragments), contains weak, no HCl reaction (with soil), weak HCl reaction (with shells)

[illegible]

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Calvert County, Maryland
Project No. 06120046

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Boring No: B-344

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Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Corred

Testing / Sampling

Sample No.	Res. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
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Material Unit Description / Drilling Method / Observations

					3 1/4" O.D. roller bit advancing between 98.5 and 103.5 ft, uniform resistance, mud Ht. gray
S-39	18	64HR	103.5-105.0	-31.2	STFTY SAND (SM), f. sand, moist, gray, contains shells (fragments), contains mica, no HCl reaction (with soil), weak HCl reaction (with shells) DC 7-17-06
					3 1/4" O.D. bitcone roller bit advancing between 103.5 and 108.5 ft, uniform resistance; drilling fluid Ht. gray
S-40	18	58SP	108.5-110.0	-36.2	POORLY (GRADED) SAND WITH STFTY (SP-SM), f. sand, moist, gray, contains shells (fragments), contains mica, no HCl reaction (with soil), weak HCl reaction (with shells)



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CCNPP Subsurface Investigation
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Boring No: B-344
Sheet 23 of 41

Boring Contractor: _____
Boring Foreman: _____
Drilling Methods: (see below) _____
Drilling Equipment Rig: _____
Hammer Type: 140-lb Auto Rod Size: _____
Schnabel Representative: _____
Dates Started: _____ Finished: _____
Location Northing: _____
Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Res. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
------------	------------	-----------------------	---------------------	------------

Material Unit Description / Drilling Method / Observations

					3 1/4" O.D. tricone roller bit advancing
					between 108.5 and 113.5 ft,
					Uniform resistance, drilling fluid
					lt. gray
S-41	18	65-7	113.5-115.0	41.2	POORLY GRADED SAND WITH SILT
					(SPSM), fine, moist, gray, est. 5-10%
					highly weathered shells (fragments), contains mica,
					no HCl reaction (with soil), weak HCl reaction (with shells)
					0.1' layer of whitish shell at 113.6 ft, shell broken
					at 114.6 ft.
					3 1/4" O.D. tricone roller bit advancing
					between 113.5 and 118.5 ft, uniform
					resistance, drilling fluid lt. gray
S-42	18	86-10	118.5-120.0	42.2	SILTY SAND (SPM), fine sand,
					moist, gray, est. 5-10% shells (fragments)
					contains mica, weak HCl reaction
					(with soil), weak HCl reaction (with shells)
					whitish shell fragments at 119.7 ft

[illegible]

[illegible]

Boring Contractor: _____

Boring Foreman: _____

Handling Methods: (see below)

Foraging Equipment Rig:

Hammer Head 140-13 Auto Rod Size: _____

Senate Representative:

Date Started: _____ **Finished:** _____

Location: _____

Ground Surface Elevation (ft):

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)

[illegible]

Logging / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Reco. (ft.)	Blow Counts / PP Data			
					¹ / ₄ " O.D. 3/4" tri-cone roller bit advancing between 133.5 and 138.5 ft., uniform resistance, drilling fluid gray
18	137.8	138.5-140.0	-66.2		SANDY SILT (ML), f. sand, mostly grayish brown, contains mica, no HCl reaction (with soil)
					3/4" O.D. tri-cone roller bit advancing between 138.5 and 143.5 ft., uniform resistance, drilling fluid gray
18	138.8	143.5-148.0	-71.2		SANDY SILT (ML), f. sand, mostly grayish brown, contains mica, weak HCl reaction (with soil)

[illegible]

	FIELD BORING LOG	GCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	Q	Boring No. 5

Boring Contractor: _____
 Boring Foreman: _____
 Drilling Methods: (see below) _____
 Drilling Equipment Rig: _____
 Hammer Type: 140-lb Auto Rod Size: _____
 Schnabel Representative: _____
 Dates Started: _____ Finished: _____
 Location Northing: _____
 Easting: _____


Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)

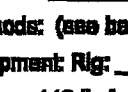

Type of Reading*	Date	Depth	Casing	Gain

Ground Surface Elevation (ft): _____

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Res. (in.)	Blow Counts / PP Data			
					3 1/2" O.D. bitcone roller bit
					advancing between 15.5 and
					158.5 ft., uniform red
					drilling fluid, gray
5-50	18	6-11	158.5-160.0	-46.2	SANDY SPT (CL), med, brown
					gray, contains mica, weak HCl
					reaction (with soil), no
					3 1/2" O.D. bitcone roller bit
					advancing between 158.5 and
					162.5 ft., uniform red
					med H ₂ gray
					END OF DAY (7:10 PM 10/07/08)
					START OF DAY (7:00 AM 10/08/08)
5-51	15	6-11	162.5-165.0	-91.2	SANDY SPT (CL), med, brown
					gray, contains mica, weak HCl
					(with soil), no reaction

		FIELD BORING LOG	GCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(Q or N) Q	Boring No.																																								
Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____			Groundwater Observations (Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion) <table border="1"> <thead> <tr> <th>Type of Reading</th> <th>Date</th> <th>Depth</th> <th>Casing</th> <th>Caved</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>			Type of Reading	Date	Depth	Casing	Caved																																			
Type of Reading	Date	Depth	Casing	Caved																																									
Testing / Sampling		Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations																																									
Sample No.	Rea. (in.)					Blow Counts / PP Data																																							
552	18	67A9	1685-1700	-96.2	3 1/2" O.D. tri-cone roller bit advancing between 1635 and 1685 ft, uniform resistance, drilling fluid gray																																								
					SANDY SILT (ML), F. Sand, moist, grayish brown, contains mica, weak HCl reaction (with soil), firm, homogeneous																																								
					3 1/2" O.D. tri-cone roller bit advancing between 1685 and 1735 ft, uniform resistance, mud (drilling fluid) gray																																								
553	8	37A10	1735-1750	-101.2	SANDY SILT (ML), F. Sand, moist, grayish brown, contains mica, weak HCl reaction (with soil), hard, homogeneous																																								
					3 1/2" O.D. tri-cone roller bit advancing between 1735 and 1785 ft, uniform resistance, mud (drilling fluid) gray																																								

[illegible]

		FIELD BORING LOG		CCNPP Subsurface Investigation Calvert County, Maryland Project No. 09120048		(Q or N) 		Boring No. B-344 Sheet 1 of 1																																														
Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____				Groundwater Observations (Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion) <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:30%;">Type of Reading*</th> <th style="width:10%;">Date</th> <th style="width:10%;">Depth</th> <th style="width:10%;">Casing</th> <th style="width:10%;">Caved</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>						Type of Reading*	Date	Depth	Casing	Caved																																								
Type of Reading*	Date	Depth	Casing	Caved																																																		
Testing / Sampling		Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations																																																		
Sample No.	Rec. (in.)	Blow Counts / PP Data																																																				
(1)	16	---	181.5-183.5	-109.2	Pitcher sample pushed*, Sample pushed 24", 28.2 sample to push sample 24", 16" recovery. Pocket penetrometer readings 4.5-6.0, 4.5-6.0, and 4.5-6.0. SILTY SAND (SM), f. fine sand, med. grayish brown, calcareous, m. to, apt 5-10% shell fragments. weak HCl reaction. weak HCl reaction.																																																	
NO 7-21-08 6-11-20																																																						
S-25	16	6-11-20	183.5-185.0	-116.2	SILTY SAND (SM), f. fine sand, med. gray, calcareous, shell fragments, weak HCl reaction. weak HCl reaction. Cemented sand layer at 184.2 ft.																																																	



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(2 of 18)

Boring No: B-34A

Sheet 11 of 11

Boring Contractor: _____

Boring Foreman: _____

Drilling Method: (see below) _____

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

East: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)

Type of Reading*	Date	Depth	Casing	Caved

Sampling		Depth Interval (ft)	Elev. (ft)
Sample No.	Reel (in.)		

7/29/08
Material Unit Description / Drilling Method / Observations
switched to 3 1/2" O.D. tricone roller bit

3 1/2" O.D. tricone roller bit
advancing between 183.5 and
188.5 ft, uniform resistance,
drilling fluid gray

5-56-18 FH-18 188.5-190.0-1162

SILTY SAND (SM), fine sand,
moist, gray, contains small
shells (fragments), no shell
(with soil), weak RCL, moderate
shells)

188.5

7/29/08

switched to 6" O.D. tricone roller bit
7/29/08
6" O.D. tricone roller bit

between 183.5 and 191.5 ft,
uniform resistance, drilling
fluid gray

Boring News

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rig: _____

Hammer Type: **140-lb Auto** Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ **Finished:** _____

Location Northing: _____

Fasting: _____

Ground Surface Elevation (ft):

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Filled, Completion)¹[illegible]

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[illegible][illegible]

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[illegible]

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Testing / Sampling

Sample	Rep. (in.)	Flow Count /	Depth Interval (ft)	Elev. (ft)
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Depth Interval
(ft)

Elev.
(10)

Material Unit Description / Drilling Method / Observations

102	22	195-925	192
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Plankton were pushed.

RECOVERED BY [redacted] PERSON

4-5-67 4-5-67

4-11-77

ACT 5 (M), R 5

1997

THE UNIVERSITY OF CHICAGO

57-16-4547-1935-450-12:2

SAUNDERS CRO, R. 10/10/10

100-443887-100

100-443887-100

normal reaction (with force)

home 10/1/84



4:5 PM



FIELD
BORING
LOG

CGNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(R or N)

Q

Boring No. 0-341

Boring Contractor: _____

Boring Foreman: _____

Drilling Method(s): (see below)

Drilling Equipment Rtg: _____

Hammer Type: 140-lb Auto Red Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Observed, During Drilling, End of Day, Start of Day, Boring Pulled, Completion)

Type of Reading	Date	Depth	Casing	Cement

Testing / Sampling

Sample No.	Size (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
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Material Unit Description / Drilling Method / Observations

START OF DAY, DEPTH 201.5 FT,

7-22-08, 7:45 AM

12

201.5-203.5

121.2

Pitcher Sampler tube pushed

sample pushed 2.4", sand

pushed in 38.4 seconds, recovery

sampled jarred as WD-3201 to

203.5 ft;

SOILY SAND (S), FINE

CLAY, weak R.C. (R.C. =

unconsolidated)

6" D.O. Scone roller bit chamber

between 203.5 and 204.0 ft

Uniform resistance, drilling

pocket penetrometer readings

4.5 to 6, 4.0 to 6, and 4.0 to 6

		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(2 of 4) 	Boring No: B-344 Sheet 2 of 2																																																							
Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) Drilling Equipment Rig: _____ Motor Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Eastng: _____ Ground Surface Elevation (ft): _____			Groundwater Observations (Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Type of Reading*</th> <th style="width: 15%;">Date</th> <th style="width: 15%;">Depth</th> <th style="width: 15%;">Casing</th> <th style="width: 15%;">Caved</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>			Type of Reading*	Date	Depth	Casing	Caved																																																		
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Testing / Sampling			Material Unit Description / Drilling Method / Observations																																																									
Sample No.	Rea. (n.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)																																																								
UD-4	24	---	204.0 - 204.3	131.7	PH. After tube sample pushed 24", 24" recovery, pocket penetrometer readings: 4.5-5.0, 4.5-5.0, and 4.5-5.0 SILTY SAND (SM), fine sand, mostly coarse, no HCl reaction (with soil), homogeneous																																																							
5-S9	18	98+13	206.0 - 207.5	133.7	SILTY SAND (SM), fine sand mostly, gray, vertical wires, no HCl reaction (with soil) switched to 3/4" turbine roller bit on 7/29/08 3/4" O.D. turbine roller bit added between 206.0 and 208.5 Uniform resistance, drilling gray, no solid clay when sampled																																																							



FIELD
BORING
LOG

GCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 00120048

(Q or N)
Q

Boring No: B-394
Sheet 1 of 1

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Soils: Representative: _____

Date Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Sounding Pulled, Completion)

Type of Reading*	Date	Depth	Gauging	Gaged

Testing / Sampling

Sample No.	Loc. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
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Material Unit Description / Drilling Method / Observations

SGO 18 47.7 2085-2100

STAT. SAND (SM), 1/2" sand
fine gray, contains some
no AC reaction (with soft)
7/21/08
Switched to 6" O.D. friction roller bit
6" O.D. friction roller bit
between 206.0 and 211.5
uniform reaction during
drilling
fine gray

DA-624 — 2115-2135 - 139.2

Pitcher tube 9" in dia. pushed 24"
in 47.7 seconds, 24" reaction
pocket penetrometer
4.5-4.8 kPa, and 4.0 kPa
STAT. SAND (SM), 1/2" sand
medium gray, contains some, no
AC reaction (with soft)



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 00430048

(S or N)

Q

Boring No: B-344
Sheet 28 of 44

Boring Contractor: _____
Boring Foreman: _____
Drilling Methods: (see below)
Drilling Equipment: Rig: _____
Hammer Type: 140-lb Auto Rod Size: _____
Schnabel Representative: _____
Dates Started: _____ Finished: _____
Location Northing: _____
Easting: _____
Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)

Type of Reading	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rea. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
561	18	514/2	2135-2150	-141.2

Material Unit Description / Drilling Method / Observations

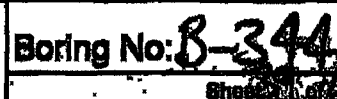
SILT-SAND (SM), f. sand, moist, gray, contains mica, no HCl reaction (with soil)

7/29/08

switched to 1 1/4" O.D. tri-cone roller bit
3 1/2" O.D. tri-cone roller bit
advancing between 2135 and 2185 ft, within 10 minutes, drilling fluid gray, contains story



SAND
SANDY SILT (ML), f. sand, moist, brownish gray, contains mica, weak HCl reaction (with soil), firm, homogeneous

562	18	614/1	2185-2200	-146.2
-----	----	-------	-----------	--------



reaction (with sol)

[illegible]

 Schnabel <small>Engineering & Construction</small>	FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120046	(G or N) 	Boring No. B-344 Sheet 1
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Boring Contractor: _____
 Boring Foreman: _____
 Drilling Methods: (see below) _____
 Drilling Equipment Rig: _____
 Hammer Type: 140-lb Auto Rod Size: _____
 Schnabel Representative: _____
 Dates Started: _____ Finished: _____
 Location: Nothing: _____
 Sealing: _____
 Ground Surface Elevation (ft): _____

Groundwater Observations				
(Examination, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)				
Type of Reading	Date	Depth	Casing	Caved

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Res. (in.)	Blow Counts / PP Data			
					<div style="text-align: right; font-size: small;">7/29/08</div> switched to 6" O.D. Teflon roller bit, 6" O.D. Teflon roller bit reaming between 223.5 and 231.5 ft, uniform resistance, drilling fluid gray, no solid cuttings when sampled
07	14		231.5-233.5	159.2	PFTZher tube sample pushed 24" in 92.97 seconds, recovery, pocket penetrometer readings 4.5 tsf, 4.5 tsf, and 4.0 tsf; SANDY SILT (ML), f. sand, no pt, gray, contains mica, weak HCl reaction (with soil)
86.5	1/6	58814	233.5-250	161.2	SANDY SILT (ML), f. sand, more brownish gray, contains mica, weak HCl reaction (with soil), hard, homogeneous

[illegible]



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Q or N)

Q

Boring No: 8-344

Sheet 1 of 1

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Eastings: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)

Type of Reading*	Date	Depth	Casing	Barrel

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample	Res. (ft.)	Blow Counts / PP Data			
1A	24	---	24.5-24.5	-169.2	Pitcher-tube sample pushed 24" in 52.2 seconds; 24" recovery, pocket penetrometer readings: 4.5 to 8, 4.5 to 8, 4.0 to 8; SANDY SILT (ML), f. sand, moist, brownish gray, contains mica, weak HCl reaction (with soil)
3-67	18	---	24.5-24.5	-171.2	SANDY SILT (ML), f. sand, moist, brownish gray, contains mica, weak HCl reaction (with soil); slight moisture odor observed (1/10/08) switched to 3/4" o.d. tri-cone roller bit 3/4" O.D. tri-cone roller bit advancing between 24.5 and 24.5 ft, uniform resistance, drilling fluid gray



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Q or N)

Q

Boring No. **B-344**
Sheet **1 of 1**

Boring Contractor: _____

Boring Foreman: _____

Drilling Method: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)

Type of Reading	Date	Depth	Casing	Cased
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Testing / Sampling

Sample No.	Res. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
1-65	18	141	248.5-250.0	-176.2

Material Unit Description / Drilling Method / Observations

02-7-23-08
OFF SANDY SILT (CL), fine
moist, brownish gray, contains
mineral, weak HCl reaction
(with soil); slight nodular
observed
02-7-24-08
END OF BORING (7-23-08, 6:00 PM)
Hole grouted upon
completion (7-24-08)

REVIEWED 8/5/08 BY THB

	FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(Q or N)	Boring No: B-345
	Sheet <u>1</u> of <u>45</u>			

Boring Contractor: Gannett
 Boring Foreman: Scott E. Flambert
 Drilling Methods: (see below)
 Drilling Equipment: Rig: CME-75 (Truck)
 Hammer Type: 140-lb Auto Rod Size: ANT
 Schnabel Representative: P. Patrick/K. Ba
 Dates Started: 7/31/08 Finished: 8/6/08
 Location Northing: 217096.7
 Easting: 960392.2
 Ground Surface Elevation (ft): 69.3

Groundwater Observations				
(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)				
Type of Reading*	Date	Depth	Casing	Cased
End of Day	7/31/08	2 ft	13.5	—
Start of Day	8/1/08	2.0 ft	13.5	—
End of Day	8/1/08	1.0 ft	13.5	—
Start of Day	8/4/08	22.0 ft	13.5	—
End of Day	8/4/08	2.0 ft	13.5	—
Start of Day	8/5/08	13.2 ft	13.5	—
End of Day	8/5/08	2.0	13.5	—
Encountered	7/31/08	13.5	13.5	—

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
5-1	16	212x2	0.0-1.5	69.3	PROBABLE FILL sampled as POORLY GRADED (B&S) sand with silt, f. sand, moist, yellowish red, est. <5% gravel, est. <5% organic matter, no HCl reaction (with soil), homogeneous color per 7/31/08
			0.0-2.5		Drillers advanced 4 1/4 in ID sand with silt probable fill silt with sand cuttings per 7/31/08 contains root fragments, yellowish red hard drilling
5-2	18	312x3	2.5-4.0	66.8	PROBABLE FILL sampled as POORLY GRADED (B&S) sand with silt, f. sand, moist, yellowish red, est. <5% mica, est <5% roots, no HCl reaction (with soil), homogeneous (contains large (thin) gray particles, probably grout that was inside of the auger).
			2.5-5.0		Drillers advanced 4 1/4 in ID auger

8/4/08



FIELD
BORING
LOG

GCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Q or N)

Boring No: B-345

Sheet 2 of 45

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below) _____

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Red Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved
End of Day	8/1/08			
Start of Day	8/6/08	28.0 ft	13.5	-
Completion	8/6/08	28.5 ft	13.5	-

Testing / Sampling

Sample No.	Req. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
					probable fill sand with silt, yellowish
					red cuttings, hard drilling
					(5.0-5.8; jar labeled as S-3A) -
S-3	13	4+3+3	5.0-6.5	64.3	PROBABLE FILL sampled as KJB 8/1/08 (sm)
					silty sand, f. sand, moist,
					pinkish gray, est. 5-10% gravel,
					strong HCl reaction (with soil),
					homogeneous.
					(5.8-6.5; jar labeled as S-3B)
					PROBABLE FILL sampled as KJB 8/1/08 (sm)
					silty sand, f. sand, moist, olive
					brown and yellowish red, strong
					HCl reaction with soil, homogeneous
			5.0-7.5		Driller advanced 4 1/4 in ID auger,
					probable fill, silty sand, moist,
					yellowish red cuttings, hard drilling
S-4	16	3+4+3	7.5-9.0	61.8	PROBABLE FILL sampled as KJB 8/1/08 (sm)
					silty sand, f. sand, moist, olive



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

Boring No: 345

Sheet 3 of 45

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*


Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
					est. 5-10% gravel
					brown and yellowish red, strong
					HCl reaction (with soil), homogeneous
			7.5-10.0		Drillers advanced 4 1/4 in ID
					auger, probable F1 silty sand,
					yellowish red cuttings, hard drilling
SS-1B	4 1/2 in		10.0-11.5	59.3	SANDY LEAN CLAY (CL),
					f. sand, moist, mottled
					yellowish red and olive brown,
					weak HCl reaction with soil,
					lensed clayey sand (1-3 inches
					thick), (clayey sand tends to
					be yellowish red white sandy
					lean clay tends to be olive brown)
			10.0		4 1/4" ID. 8/5/00
					Drillers changed From Augers
					to mud rotary drilling
			10.0-13.5	59.3	Drillers advanced 3 1/2 in Tricone
					roller bit, olive brown drilling fluid,

		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048		(Q or N)	Boring No: 345
					Sheet 4 of 4	

Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____					Groundwater Observations (Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)* <table border="1" style="width:100%; border-collapse: collapse; margin-top: 5px;"> <tr> <th style="width: 30%;">Type of Reading*</th> <th style="width: 15%;">Date</th> <th style="width: 15%;">Depth</th> <th style="width: 15%;">Casing</th> <th style="width: 25%;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>					Type of Reading*	Date	Depth	Casing	Caved																																			
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Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Res. (in.)	Blow Counts / PP Data			
S-6	1B	2+3+3	13.5-15.0	14.0 55.0 RB 2/1/00 11/2/00	(gray drilling fluid and silt clumps cuttings), easy drilling (13.5-14.5 Jar Labeled as S-6A) SANDY LEAN GLAY (CL), f. sand, wet, grayish purple, no HCl reaction (with soil), fine, homogeneous. (14.0-15.0 jar labeled as S-6B) CLAYEY SAND (SC), f. sand, wet, grayish purple, est. < 5% mica, no HCl reaction (with soil), homogeneous
			15.0-16.0		Drillers advanced 3 1/2 in OD tricone roller bit, gray drilling fluid
S-7	1B	3+3+3	16.0-17.5	63.3	(16.0-16.5 Jar labeled as S-7A) CLAYEY SAND (SC), f. sand, wet

		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 98120048	(Q or N)	Boring No: B-345 Sheet 2 of 4
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____					Groundwater Observations (Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)* <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <th style="width: 30%;">Type of Reading*</th> <th style="width: 15%;">Date</th> <th style="width: 15%;">Depth</th> <th style="width: 15%;">Casing</th> <th style="width: 25%;">Cased</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>					Type of Reading*	Date	Depth	Casing	Cased																																			
Type of Reading*	Date	Depth	Casing	Cased																																													

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
					grayish purple, no HCl reaction
					(with soil), homogeneous
					(16.5 to 17.5 Jar labeled as
					S-7B) SANDY LEAN CLAY
					(CL), f. sand, wet, grayish
					purple, no HCl reaction (with
					soil), hard, homogeneous
			16.0-18.5		Drillers advanced 3 1/2 in
					OD tricone collar bit, gray
					drilling fluid (gray drilling
					fluid with gray silt clumps
					and yellowish red sand clumps
					cuttings), easy drilling
S-8	18	344.5	S-200	50.0	FAT CLAY (CH), wet, grayish
					purple, no HCl reaction (with
					soil), hard, homogeneous
			18.5-21.0		Drillers advanced 3 1/2 in
					OD Tricone

Schnabel Schnabel Engineering		FIELD BORING LOG		CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048		(Q or N)	Boring No: B-345 Sheet 6 of 95
Boring Contractor:				Groundwater Observations (Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*			
Boring Foreman:				Type of Reading*	Date	Depth	Casing
Drilling Methods: (see below)							
Drilling Equipment: Rig:							
Hammer Type: 140-lb Auto Rod Size:							
Schnabel Representative:							
Dates Started: Finished:							
Location Northing:							
Easting:							
Ground Surface Elevation (ft):							
Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations		
Sample No.	Rep. (in.)	Blow Counts / PP Data					
					collar bit, gray drilling fluid (gray drilling fluid with clay clumps and fine sand cuttings), easy drilling		
5-9	18	445+7	21.0 - 22.5	48.3	FAT CLAY (CH), wet, grayish purple, no HCl reaction (with soil), hard, lensed with small (<0.5 in diameter) yellowish red sand pockets		
			21.0 - 23.5		Drillers advanced 3 1/2 in OD Tricone collar bit, gray drilling fluid (gray drilling fluid with clay clump cuttings), harder drilling		
5-10	18	528+9	23.5 - 25.0	45.8	SANDY LEAN CLAY (CL), wet, grayish purple, contains 0.5 inch layer of clayey sand (SC); wet, grayish purple at 24.8 ft, no HCl reaction		


	FIELD BORING LOG	CONPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(Q or M)	Boring No: <u>B-345</u> Sheet <u>2</u> of <u>45</u>
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Red Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="text-align: center;">Type of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																			
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Type of Reading*	Date	Depth	Casing	Caved																																															

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
					PP 7/31/08
					(with soil), hard, layers
					homogeneous
			23.5-26.0		Driller advanced 3 1/2' OD
					Tricone roller bit, uniform
					drilling, gray drilling fluid
8-11	18	24345	26.0-27.5	433	26.0-26.5 Jar labeled as 8-11A
					CLAYEY SAND (SC), f. sand,
					wet, grayish purple, no HCl
					reaction (with soil), homogeneous
					(26.5-27.5 Jar labeled as 8-11B)
					SILTY SAND (SM), f. sand,
					wet, grayish purple, no HCl
					reaction (with soil), homogeneous
			27.5		End of Day 7/31/08 6:15 PM
			27.5		Shovel passed switched from Ann
					Patrol to River Bell


		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048		(Q or N)	Boring No. B-395 Sheet <u>8</u> of <u>45</u>																																																								
Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____			<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="text-align: center;">Type of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Caved</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>					Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																								
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Type of Reading*	Date	Depth	Casing	Caved																																																										
Testing / Sampling		Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations																																																										
Sample No.	Rod (in.)	Blow Counts / PP Data																																																												
		27.5	27.5		START OF DAY Drilling at 27.5 ft 9/1/87 7:00a																																																									
			26.0-28.5		Advance 3 1/2" OD Triane Roller Bit;																																																									
					uniform resistance, smooth drilling,																																																									
					drilling fluid gray, cuttings observed are																																																									
					clayey sand, f. to med sand																																																									
S-12	17"	7+19+13	28.5-30	40.8	SILTY SAND (SM), f. to med sand,																																																									
					moist, dk gray, contains mica,																																																									
					no HCl reaction, weak cementation																																																									
					(from 28.5 to 30.0 ft), homogeneous																																																									
			28.5-31.0		Advance 3 1/2" OD Triane Roller Bit;																																																									
					uniform drilling, harder drilling,																																																									
					drilling fluid gray, cuttings are																																																									
					clumps of silty sand, f. to med sand																																																									
S-13	12"	14+50%	31.0-32.0	38.3	SILTY SAND (SM), f. to med sand,																																																									
					moist, dk gray (from 31.0 to 31.8 ft) light gray																																																									
					(from 31.8 to 32.0 ft), est 45% shells (f. to																																																									
					med sand size, highly weathered)																																																									

9/1/87

		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048		(2 of 4)	Boring No: B-345 Sheet 2 of 25	
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Red Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="text-align: center;">Type of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																			
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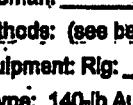
Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
					est 45% f. gravel (concrete sand), subrounded
					f. gravel, no HCl reaction (with soil), weak
					HCl reaction (with shells), weak cementation,
			31.0-35.5		Advanced 3 1/2" OD Triane Roller Bit; uniform
					resistance, slight rig chatter at 33.0 ft (possible
					concrete sand), drilling fluid gray, cuttings
					observe are silty sand, f. to med sand.
5-14	9"	33.5%	33.5-34.4	35.8	PDDRLY GRADED SAND WITH SILT (SP-SM)
					f. to med sand, med; light gray,
					est 5-10% shells (f. sand size, fairly
					weathered), no HCl reaction (with soil), weak
					HCl reaction (with shells), (shells decrease
					with depth).
			33.5-36.0		Advanced 3 1/2" OD Triane Roller Bit, uniform
					resistance, hard drilling, drilling fluid
					gray, cuttings observed are clumps of
					silty sand, f. to med sand

		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048		(Q or N)	Boring No: B-345	
						Sheet 10 of 25	

Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Red Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations.</th> </tr> <tr> <th colspan="5" style="text-align: center;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="text-align: center;">Type of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations.					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																			
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(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*																																																			
Type of Reading*	Date	Depth	Casing	Caved																																															

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Recon. (in.)	Blow Counts / PP Data			
S-15	5"	215	36.0-36.5	33.5	POORLY GRADED SAND WITH SILT (SP-SM), f. to med sand, wet, light gray, est 55% shells (f. sand size, ^{highly} moderately weathered), NO HCl reaction (with soil), weak HCl reaction (with shells), 36.0-38.5 Advanced 3 1/2" OD Tricore Roller Bit; uniform resistance, hard drilling, drilling fluid gray, cuttings describe are clumps of silty sand, f. to med sand.
S-16	11"	131/1111	38.5-40.0	30.8	POORLY GRADED SAND WITH SILT, (SP-SM), f. to med sand, wet, gray med. light gray, est 50-100% shells (f. to med sand size, ^{highly} moderately weathered), weak HCl reaction (with soil and shells) 38.5-41.0 Advanced 3 1/2" OD Tricore Roller Bit; softer drilling at 39.0 ft, drilling fluid gray, cuttings describe are clumps of

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 Schnabel Engineering	FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(Q or N)	Boring No: B-345 Sheet 11 of 45
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center; font-size: small;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="width: 30%;">Type of Reading*</th> <th style="width: 15%;">Date</th> <th style="width: 15%;">Depth</th> <th style="width: 15%;">Casing</th> <th style="width: 25%;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																			
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(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*																																																			
Type of Reading*	Date	Depth	Casing	Caved																																															

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
					silty sand, f. to med. sand, f. to med. shells
3-17	11"	38+38+13	41.0-42.5	28.3	MODERLY GRAINED SAND WITH SILT, (SP.5M), f. to med. sand, med, light gray, est 15-25% shells (f. to c. sand size), highly moderately ^{highly} moderately weathered, Angular c. sand size shells, (contains a 1.0 inch layer of sandy silt (med), f. sand, med, dark gray, est 45% shells, weak RQD with soil and shells, soft, (at 42.4 ft), weak RQD reaction with soil and shells.
			41.0-43.5		Advanced 3 1/2" OD Tricone Roller Bit; Steadily easier drilling with depth, drilling flux gray, cuttings observed are clumps of silty sand, f. to med. sand, f. to med. shells



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Q or N)

Boring No: B-345

Sheet 12 of 12

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below) _____

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

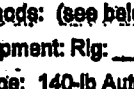
Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Req. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
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Material Unit Description / Drilling Method / Observations

S18	16"	5597	435-45.0	25.8	SANDY LEAN CLAY (CL); f. sand, moist light gray, est 5.5% shells (f. to med sand highly weathered) size, moderately to highly weathered, contains mica, weak HCl reaction (with soil and shells), firm to hard, nonplastic
			42.5-46.0		Advanced 3 1/2" OD Triane Roller Bit; uniform drilling, smooth drilling, drilling fluid light gray, cuttings Adverse Arc clumps of sandy clay and silty sand, f. to med sand, f. to med shells
S19	18"	3135	460-47.5	23.3	SANDY LEAN CLAY (CL), f. sand, moist, light gray, est 5.5% shells (f. sand size highly weathered), contains mica, no HCl reaction (with soil), weak HCl reaction (with shells), firm to hard, (contains 5.5% organic material (Rough cathall)

 Schnabel Engineering	FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048	(A or N)	Boring No: B-345 Sheet 13 of 25
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center; font-size: small;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="width: 30%;">Type of Reading*</th> <th style="width: 15%;">Date</th> <th style="width: 15%;">Depth</th> <th style="width: 15%;">Casing</th> <th style="width: 25%;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																			
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(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*																																																			
Type of Reading*	Date	Depth	Casing	Caved																																															

Testing / Sampling				Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Reo. (in.)	Blow Counts / PP Data				
				46.0-48.5		Advance 3 1/2" OD Micro Roller Bit; Uniform resistance, smooth drilling, drilling fluid gray, cuttings observed are clumps of clayey sand, f. to med. sand, f. to med shells
3-20	18"	31444		48.5-50	20.8	CLAYEY SAND (SL), f. to med sand, moist, contains mica, est. 4.5% shells, f. to med. sand size, fracture to ^{slightly} slightly weather NO HCl reaction (with soil), weak HCl reaction (with shells), homogeneous.
				48.5-51.0		Advance 3 1/2" OD Tricone Roller Bit; Heavy Rig Chatter and hard resistance at from 50.5 to 51.0 (Reason: cemented layer), drilling fluid gray, cuttings observed are clumps of clayey sand, f. to med sand, f. to med shells



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

Boring No: *B-345*

Sheet *14* of *45*

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
<i>S21</i>	<i>6"</i>	<i>9 1/2"</i>	<i>51.0-51.5</i>	<i>13.3</i>	<i>CLAYEY SAND (SC), f. to med sand, gray + brownish gray, wet, est 45% shells (f. to med sand size, fracture to extremely highly weathered), est 5-10% f. gravel (cemented sand), subangular to subround f. gravel, NO HCl reaction (with Soil, weak HCl reaction (with shells and cemented sand), moderate to strong cementation</i>
			<i>52.0-53.5</i>		<i>Advance 3 1/2" OD Tricone Roller Bit; hard drilling from 51.0 to 53.0, soft drilling from 53.0 to 53.5, drilling flux gray, cuttings observed are clayey sand f. to med sand, f. to C. shells.</i>
<i>S22</i>	<i>16"</i>	<i>51.0-53.0</i>	<i>53.5-53.0</i>	<i>15.8</i>	<i>SLTAY SAND (SM), f. to med sand, wet, light brownish gray, est 5-10% shells (f. sand to f. gravel size, fracture highly to extremely weathered + gravel angular.)</i>

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FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Q or N)

Boring No: *B-345*

Sheet *15* of *45*

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Cased
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Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data
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Depth Interval (ft)

Elev. (ft)

Material Unit Description / Drilling Method / Observations
--

					est 5.5% F-grain (cemented sand), cemented to sub angular F-grain, no HCl reaction with soil, weak HCl reaction (with shells), moderate to strong cementation.
			53.5-56.0		Advanced 3 1/2" OD Tissue Roller Bit; heavy r/c chatter at 55.5 ft (Possible cemented sand), drilling fluid gray, cuttings observed are silty sand, f. to med. sand. f. to c. shells
523	10"	90618	560-57.5	13.3	SILTY SAND (SM), f. to med. sand, wet, medium gray and gray, est. 15-20% shells (f. to c. sand size angular @ 15% highly c. sand size, fresh to highly weathered) NO HCl reaction (with soil), weak HCl reaction (with shells)
			560-58.5		Advanced 3 1/2" OD tissue Roller Bit; uniform resistance, smooth drilling,



FIELD
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LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Q or N)

Boring No: B-395

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Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Res. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
					drilling fluid gray, cuttings observed are
					silly sand, f. to med sand, f. to
					med. shells
S24	18"	4+5+7	58.5 - 60.0	10.8	SECT SAND (SM), f. to med sand, wet
					gray and blue gray, est 5-5% shells
					(f. to med sand size, fresher to highly highly
					weathered), no HCl reaction (with soil),
					weak HCl reaction (with shells), manganese
			58.5 - 61.0		Adverse 3 1/4" OD Tissue Roller Bit;
					uniform resistance, smooth drilling,
					drilling fluid gray; cuttings observed
					are silly sand, f. to med. sand,
					f. to med. shells
S25	17"	7+8+11	61.0 - 62.5	8.3	SECT SAND (SM), f. to med. sand, wet,
					dk. gray and gray, est 5-10% shells
					(f. sand to f. gravel size, regular f. gravel size,
					highly
					fresher to highly highly weathered), no HCl reaction

⊗ 4/10/08



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

Boring No: B-345

Sheet 12 of 45

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

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Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved
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Testing / Sampling

Sample No.	Rec. (In.)	Blow Counts / PP Data
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Depth Interval (ft)

Elev. (ft)

Material Unit Description / Drilling Method / Observations
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					(with soil), weak HCl reaction (with shells).
			61.0-63.5		Advanced 3 1/2" OD Triane Roller Bit ;
					uniform resistance, smooth drilling, drilling
					fluid gray, cuttings observed are silty sand
					f. to med. sand, f. to med. shells
526	15"	9.8+7	63.5-65.0	5.8	SEILTY SAND (SM), f. to med. sand,
					wet, gray, est 15-25% shells
					(f. sand to f. gravel size, subangular to
					angular f. gravel size, fresher to highly
					weathered), no HCl reaction (with
					soil), weak HCl reaction (with shells), shell
					size increases with depth)
			63.5-66.0		Advanced 3 1/2" OD triane roller Bit ;
					uniform resistance, smooth drilling,
					drilling fluid gray, cuttings observed are
					silty sand, f. to med. sand, f.
					to med. shells



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Q or N)

Boring No: B-345

Sheet 28 of 25

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

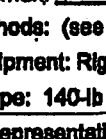
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Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

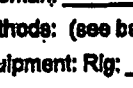
Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
5-27	18"	016+10	66.0-68.5	3.3	SILTY SAND (Sm), f. to med sand, wet, gray, est 45% shells (f. to med sand size, highly moderately to highly weathered), no HCl reaction (with soil), weak HCl reaction (with shells), manganese
			66.0-68.5		Advanced 3 1/2" Oil Tricone Roller Bit; uniform resistance, smooth drilling, drilling fluid gray, cuttings observed are silty sand, f. to med sand, f. to med shells
5-28	18"	4+5+8	68.5-70.0	0.8	SILTY SAND (Sm), f. to med. sand, wet, gray and olive gray, est 45% shells highly (f. to med sand size, moderately to moderately weathered), no HCl reaction (with soil), weak HCl reaction (with shells), manganese
			68.5		Driller de-aired 150 gallon med. tank, driller added 50 gallon of clean water with 1/2 bag of bentonite to drilling fluid

 Schnabel Engineering	FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048	(Q or N)	Boring No: B-345 Sheet 12 of 45
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center; font-size: small;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="text-align: center;">Type of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																			
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(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*																																																			
Type of Reading*	Date	Depth	Casing	Caved																																															

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / FP Data			
					Driller flushed hole with fresh drilling fluid to prevent collapse over the weekend, driller took end of day water level reading
			68.5		END OF DAY Drilling at 68.5 ft 8/1/08 11:00 AM
					START OF DAY Drilling at 68.5 ft 8/4/08 8:00 AM
					Driller took start of Day water level Reading
			68.5-71.0		Advanced 3 1/2" OD Tricone Roller Bit, uniform resistance, smooth drilling, drilling fluid gray, cuttings observed are clumps of silty sand, f. to med. sand, med. shells.

 Schnabel Engineering	FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(Q or N)	Boring No: B-345 Sheet 90 of 45
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="text-align: center;">Type of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																			
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Type of Reading*	Date	Depth	Casing	Caved																																															

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
S-29	18"	4+5+7	71.0 - 72.5	-1.7	SILTY SAND (SM), f. to med sand, wet, gray and light gray, est 55% shells, f. to med sand size, moderately to highly (f. to med sand size, moderately to highly extremely weathered), NO HCl reaction (with soil), weak HCl reaction (with shells), homogeneous
			71.0 - 73.5		Advanced 3 1/2" OD Tricone roller bit; uniform Resistance, smooth drillings, drilling fluid gray, cuttings observed are silty sand, f. to med sand
S-30	18"	4+4+7	73.5 - 75.0	-4.2	SILTY SAND (SM), f. to med sand, wet, gray and light gray, est 65% shells, (f. sand size, extremely highly weathered), NO HCl reaction (with soil), weak HCl reaction (with shells), homogeneous

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 Schnabel Engineering		FIELD BORING LOG		CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048		(Q or N)		Boring No: B-345	
		Sheet 41 of 45							

Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____				Groundwater Observations (Encountered, During Drilling, End of Day, Start of Day, Closing Piped, Completion)*				
				Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
			735-760		Advanced 3 1/2" OD. Tricone Roller Bit; Uniform resistance, smooth drilling, drilling fluid gray, cuttings observed are silty sand, f. to med sand
S-31	10"	4x16x14	760-77.5	-6.7	SILTY SAND (Sm), f. to med sand, med, gray, est 45% shells (f. to med size to med highly extremely weathered), weak Hcl reaction (with soil and shells), weak cementation (from 77.3 to 77.5 ft)
			760-785		Advanced 3 1/2" OD. Tricone Roller Bit; Slight rig chatter at 77.0 ft (possible cemented sand), drilling fluid gray, cuttings observed are silty sand, f. to med sand
S-32	11"	16x50x14	78.5-79.4	-9.2	SILTY SAND WITH GRAVEL, f. to med sand & f. gravel, abundant to sub angular f. gravel, med gray and light gray

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Boring No: **B-345**Sheet **22** of **45**

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
					est 5-10% shells (f. to c. sand size) @ 75/100 highly Angular, fresh to fresh weathered Weak HCl reaction (with soil and shells)
					MODERATE to Strong cementation (f. sands)
			78.5-81.0		Advanced 3 1/2" OD Tricone Keller Bit; Heavy Rig chatter throughout (possible cemented sand), drilling fluid gray Cuttings observed are silty sand f. to med sand, f. to med Shells
S-33	17"	41/25/10	81.0-82.5	-11.7	SILTY SAND WITH GRAVEL (SM), f. to med. SAND, f. gravel, subangular to subangular f. gravel, med, gray and light gray, est 15-25% shells (f. to c. sand size) @ 75/100 highly Angular, fresh to fresh weathered; NO HCl reaction (with soil), weak HCl reaction (with shells and cemented sand), Strong



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Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PF Data	Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
					Cementation (f. gravel); (cemented sands increase with depth)
			81.0-83.5		Advanced 3 1/2" OD Tissue Roller Bit; Slight rig chatter throughout, hard drilling drilling fluid light gray, cuttings observed are silty sand, f. to med sand, f. to med shells
534	17"	B111435	83.5-85.0	-14.2	SILTY SAND (SM), f. to med sand, wet, gray and light gray, est. 5-10% shells (f. to c. sand size), angular, also highly fresh to moderately weathered; est 2-5% f. gravel (cemented sand), no HCl reaction (with soil), weak HCl reaction (with shells and cemented sand), weak to moderate cementation
			85.5-86.0		Advanced 3 1/2" OD Tissue Roller Bit; uniform resistance, smooth drilling, drilling fluid gray

Schnabel Schnabel Engineering		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120049	(Q or N)	Boring No: <u>B-345</u> Sheet <u>28</u> of <u>25</u>
Boring Contractor: _____			Groundwater Observations		
Boring Foreman: _____			(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*		
Drilling Methods: (see below)			Type of Reading*	Date	Depth
Drilling Equipment Rig: _____					
Hammer Type: 140-lb Auto Rod Size: _____					
Schnabel Representative: _____					
Dates Started: _____ Finished: _____					
Location Northing: _____					
Easting: _____					
Ground Surface Elevation (ft): _____					
Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Ret. (in.)	Blow Counts / R/P Data			
					Cuttings observed are silty sand, f. to med. sand, f. to med. shells
S-35	17"	200610	86.0 - 87.5	-16.7	SILTY SAND (SM), f. to med. sand, wet, gray med olive gray, est 45% shells (f. to med. sand size, moderately highly to ^{to} weathered), NO HCl reaction (with soil), weak HCl reaction (with shells).
			88.0 - 88.5		Advanced 3 1/2" OD Tribore Roller Bit; Uniform resistance, smooth drilling, drilling fluid light gray, cuttings observed are silty sand, f. to med. sand, f. to med. shells.
S-36	18'	41619	88.5 - 90.0	-19.2	SILTY SAND (SM), f. to med. sand, med. olive gray, (contains a 1.0 inch layer of SPT WITH SAND (GOL), olive, f. sand, med, SPT at 88.7 ft and 89.0 ft and 89.5 ft), est 45% shells (f. to med. sand



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Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved
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Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
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Material Unit Description / Drilling Method / Observations

					highly size, fresh to fresh weathered, no HCl reaction (with soil), weak HCl reaction (with shells)
			88.5-93.5		Advanced 3 1/2" OD Tricone Roller Bit; uniform resistance, smooth drilling, drilling fluid light gray, cuttings observed are silty sand, f. to med sand.
S-37	18"	11+9+10	93.5-95.0	-24.2	STICKY SAND (SM), f. sand, med, olive gray, est 5-10% shells (f. to med sand size, fresh to highly weathered), weak HCl. reaction (with soil and shells) (shells decrease with depth)
			93.5-98.5		Advanced 3 1/2" OD Tricone Roller Bit; uniform resistance, smooth drilling, drilling fluid light gray, cuttings observed are silty sand, f. to med sand

 Schnabel Engineering		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(Q or N)	Boring No: B-345 Sheet 26 of 45
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) Drilling Equipment Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="text-align: center;">Type of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																			
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Type of Reading*	Date	Depth	Casing	Caved																																															

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
5-38	18"	41617	98.5-100.0	-29.2	SILTY SAND (Sm), f. sand, med, olive gray, est 55% shells (f. to med highly discrete sand size, moderately to highly weathered), no HCl reaction (with soil), weak HCl reaction (with shells), homogeneous
			98.5-103.5		Advanced 3 1/2" OD Tricone Roller Bit; uniform resistance, smooth drilling; drilling fluid: light gray, cuttings observed are silty sand, f. to med sand, f. to med. shells
5-39	18"	910111	103.5-105.0	-34.2	SANDY SILT (ML), f. sand, med, olive gray, est 55% shells (f. highly discrete sand size, moderately weathered), no HCl reaction with soil, weak HCl reaction with shells, fine, homogeneous
			103.5-108.5		Advanced 3 1/2" OD Tricone Roller Bit; uniform resistance, smooth drilling

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Boring Contractor: _____
 Boring Foreman: _____
 Drilling Methods: (see below)
 Drilling Equipment: Rig: _____
 Hammer Type: 140-lb Auto Rod Size: _____
 Schnabel Representative: _____
 Dates Started: _____ Finished: _____
 Location Northing: _____
 Easting: _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Ground Surface Elevation (ft): _____

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Req. (In.)	Blow Counts / PP Data			
					drilling fluid light gray, cuttings observed
					are silty sand, f. to med. sand, f. to med. shells
S-40	18"	6+8+10	108.5-110.0	-39.2	SILTY SAND (Sm), f. sand, moist, blue gray, est 4.5% shells (f. to med sand size, highly weathered), no HCl reaction (with sand), weak HCl reaction (with shells), homogeneous
			108.5-113.5		Midrange 3 1/2" OD. Tricone Roller Bit ; Slight rig chatter from 111.0 to 111.5 ft (possible cemented sand), drilling fluid blue gray, cuttings observed are clean of silty sand, f. to med sand, f. to med shells
S-41	18"	6+8+4	113.5-115.0	-44.2	SILTY SAND (Sm), f. to med sand, wet blue-gray, est 5-10% shells (f. sand to C sand size, angular, frags to highly

2/15/08



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Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved
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Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
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Material Unit Description / Drilling Method / Observations

⑧ 8/15/00

~~Interp. weathered~~ NO HCl reaction (with soil), weak HCl reaction (with shells)

113.5-118.5

Advanced 3 1/2" OD Tricone Roller Bit;

Uniform resistance, smooth drillings,

drilling fluid olive-gray, cuttings

Observed are silty sand, f. to med.

sand, f. to med. shells

S-42

1B

546±9

118.5-120.0

-99.2

SELT SAND (S.S.) f. sand, med,

olive gray and grayish brown; est. 45%
shells (f. to med sand size, moderately

highly ~~to ~~highly~~ weathered~~), weak HCl

reaction (with soil and shells),

homogeneous

118.5-123.5

Advance 3 1/2" OD Tricone Roller Bit;

Uniform resistance, smooth drillings

drilling fluid olive gray, cuttings observed

are silty sand, f. to med sand, f. to med shells

		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048	(Q or N)	Boring No: B-345 Sheet <u>31</u> of <u>45</u>
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center; font-size: small;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="text-align: center;">Type of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																								
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Type of Reading*	Date	Depth	Casing	Caved																																																				

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / pp Data			
S-43	1R	7+9+11	123.5-125.0	-54.2	SILTY SAND (sm), f. sand, moist, olive gray and gray, est 5-5% shells highly Debris (f. sand size, totally weathered), weak HCl reaction (with soil and shells), homogeneous
			123.5-128.5		Advanced 3 1/2" OD tricone Roller Bit; uniform resistance, smooth drilling, drilling fluid gray and olive gray, cuttings observed are silty sand, f. to med. sand
S-44	11"	6+7+9	128.5-130.0	-59.2	SILTY SAND (sm), f. sand, moist, olive gray and grayish brown, est 5-5% shells (f. to med. sand size, moderately to totally weathered), weak HCl reaction (with soil and shells), homogeneous
			128.5-133.5		Advanced 3 1/2" OD Tricone Roller Bit; uniform resistance, smooth drilling, drilling fluid olive gray, cuttings observed are silty sand

		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048		(Q or N)	Boring No: <u>B-345</u>																																									
						Sheet <u>32</u> of <u>45</u>																																									
Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____			Groundwater Observations (Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*																																												
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Testing / Sampling			Material Unit Description / Drilling Method / Observations																																												
Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)																																											
					f. to med sand.																																										
			133.5		Marsh fennel test taken (41.0 sec. drilling flux)																																										
S-45	18"	6+9+10	133.5-135.0	-69.2	SELTY SAND (SM), f. sand, moist, olive gray and grayish brown, est 15% shells highly weathered, weak HCl reaction (with soil and shells), manganese																																										
			133.5-138.5		Advanced 3 1/2" OD Tricone Roller Bit; uniform resistance, smooth drilling, drilling fluid olive gray, cuttings observed are silty sand, f. to med sand.																																										
S-46	18"	5+5+8	138.5-140.0	-69.2	SELTY SAND (SM), f. sand, moist, olive gray, no HCl reaction, manganese																																										
			138.5-142.5		Advanced 3 1/2" OD Tricone Roller Bit; uniform resistance, smooth drilling, drilling fluid olive gray, cuttings observed are silty sand																																										



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Boring Contractor: _____
Boring Foreman: _____
Drilling Methods: (see below)
Drilling Equipment: Rig: _____
Hammer Type: 140-lb Auto Rod Size: _____
Schnabel Representative: _____
Dates Started: _____ Finished: _____
Location Northing: _____
Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
					f. to med. sand.
547	18"	719+11	143.5-145.0	-74.2	SANDY SILT (ML), f. sand, moist, blue gray, est 45% shells (f. sand highly @ 21502 size, fairly weathered), weak HCl reaction (with soil and shells), hard, homogeneous
			143.5		Driller de-sanded 180 gallons of drilling fluid, driller flushed out boring with new drilling fluid
					End of Day Drilling at 145.0 ft
					8/4/00 6:10 pm
					Start of Day Drilling at 145.0 ft
					8/5/00 7:00 am
					Driller took start of day water level reading, driller added ~ 50 gallons of clean water to drilling fluid and cleaned out the hole

	FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(Q or N)	Boring No: B-345 Sheet <u>23</u> of <u>25</u>
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Boring Contractor: _____
 Boring Foreman: _____
 Drilling Methods: (see below) _____
 Drilling Equipment: Rig: _____
 Hammer Type: 140-lb Auto Rod Size: _____
 Schnabel Representative: _____
 Dates Started: _____ Finished: _____
 Location Northing: _____
 Easting: _____
 Ground Surface Elevation (ft): _____

Groundwater Observations				
(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*				
Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
			143.5-148.5		Drill Advance 3 1/2" OD Tricone Roller Bit; uniform resistance, smooth drilling, drilling fluid light gray, cuttings observed are silty sand, f. sand
			148.5		Marsh funnel test taken (41 sec drilling fluid)
S-48	18"	7/10/11	148.5-150.0	-79.2	SANDY SILT (ML), f. sand, moist, olive gray, est 45% shells (f. sand highly finely ^{medium} weathered), weak HCl reaction (with soil and shells), firm, homogeneous
			148.5-153.5		Advanced 3 1/2" OD Tricone Roller Bit; uniform resistance, smooth drilling, drilling fluid olive gray, cuttings observed are silty sand, f. sand.
S-49	18"	7/11/10	153.5-155.0	-84.2	SANDY SILT (ML), f. sand, moist, olive gray, est 45% shells (f. sand size, highly finely ^{medium} weathered), weak HCl reaction (with soil and shells),

② 8/1/08

		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048		(Q or N)	Boring No. B-345 Sheet 33 of 45	
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____					Groundwater Observations (Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*				
		Type of Reading*	Date	Depth	Casing	Caved			

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
					firm, homogeneous
			153.5-158.5		Advanced 3 1/2" OD tricone Roller Bit ;
					Uniform resistance, smooth drilling,
					drilling fluid olive gray, cuttings observed
					are silty sand, f. sand
S-50	18"	7+9+12	158.5-160.0	-89.2	SANDY Silt (mc), f. sand, moist,
					Olive gray, est 45% shells (f. sand
					highly calcareous
					Silt, very weathered, weak HCL
					reaction (with soil and shells), firm
					homogeneous
			158.5-163.5		Advanced 3 1/2" OD tricone Roller
					Bit ; uniform resistance, smooth
					drilling, drilling fluid olive
					gray, cuttings observed are silty
					sand f. sand
S-51	18"	7+9+10	163.5-165.0	-94.2	SANDY Silt (mc), f. sand, moist,
					Olive gray and grayish tan, est 45%



FIELD
BORING
LOG

CGNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Q or N)

Boring No: B-345

Sheet 32 of 45

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Piled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
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Material Unit Description / Drilling Method / Observations

					shells (f. sand size, ^{highly} extremely weathered),
					weak HCl reaction (with soil and shells)
					firm, lensed (0.5 to 1.5 inch pocket
					of silty sand)
			163.5-168.5		Advanced 3 1/2" OD Tricore Roller Bit;
					uniform resistance, smooth drilling,
					drilling fluid olive gray, cuttings
					observed are silty sand, f. sand
352	18"	7+10+12	168.5-170.0	~99.2	SANDY SILT (ML), f. sand, most
					olive gray, est 65% shells (f. sand
					^{highly} extremely weathered), weak HCl reaction
					(with soil and shells), firm, homogeneous
			168.5-173.5		Advanced 3 1/2" OD Tricore Roller Bit;
					uniform resistance, smooth drilling,
					drilling fluid olive gray, cuttings
					observed are silty sand, f.
					sand.

 Schnabel Engineering		FIELD BORING LOG		CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048		(Q or N)		Boring No: B-345	
								Sheet 3 of 45	

Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____					<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="width: 30%;">Type of Reading*</th> <th style="width: 15%;">Date</th> <th style="width: 15%;">Depth</th> <th style="width: 15%;">Casing</th> <th style="width: 25%;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>					Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																			
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Type of Reading*	Date	Depth	Casing	Caved																																																							

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (In.)	Blow Counts / PP Data			
S-53	18"	819+11	173.5 -		Driller pumped drilling fluid collected in drums (material that went through the desander) Driller added ~ 25 gallons of clear water to the mud tub. Driller cleaned out neck of mud tub with 5 gallon bucket.
S-53	18"	819+11	173.5 - 175.0	-104.2	SANDY SILT (ml), f. sand, moist, olive gray, est 65% shells (f. sand highly weathered), weak HCl reactions (with soil and shells), firm, friable.
			173.5 - 178.5		Advanced 3 1/2" OD Tricone Roller Bit; uniform resistance, smooth drilling, drilling fluid: olive gray, cuttings observed are clumps of sandy silt, f. sand jar (at 815/08).
S-54	18"	4+10+13	178.5 - 182.0	-109.2	(178.5 - 179.3 labeled as S-54A) SILTY SAND (3m), f. sand, moist, olive gray, est 65% shells (f. to med.

		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(Q or N)	Boring No: B-345 Sheet 36 of 45
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
Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment Rtg: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="text-align: center;">Type of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																			
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Type of Reading*	Date	Depth	Casing	Caved																																															

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
					<div style="text-align: right;">highly weathered</div> sand size, moderately to extremely weathered
					weak HCl reaction with (soil and shells),
					<div style="text-align: right;">@ 21508</div> dangerous jar
					(179.3 - 180.0' label as S-54A)
					POORLY GRADED SAND WITH SPT (SPSM)
					F. sand, wet, olive gray and light
					gray, eat 15-25% shells (F. sand to
					F. gravel size, angular, fresh to highly
					<div style="text-align: right;">@ 21508</div> extremely weathered, NO HCl reaction
					(with soil), weak HCl reaction (with shells)
			1785-1835		Advance 3 1/2" ON Tricone Roller Bit;
					uniform resistance, harder drilling
					drilling fluid olive gray, cuttings
					observed are clumps of sandy silt
					F. sand.
			183.5		Driller's rods got clogged with sand,
					silt and shells, driller took off 35 ft

		FIELD BORING LOG	GCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048	(Q or N)	Boring No: B-345 Sheet <u>37</u> of <u>21</u>
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location: Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="text-align: center;">Type of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																			
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Type of Reading*	Date	Depth	Casing	Caved																																															

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
					of rocks and flushed at the remaining
					rocks, rocks cleared with ease.
S-55	1/8"	7410/14	183.5-185.0	-114.2	POORLY GRADED SAND WITH SILT (SP-5),
					f. sand, wet, gray and olive
					gray, est 25% shells (f. sand
					highly discrete ^{discrete}
					size, extremely ^{extremely} weathered, weak HCL
					reaction (with soil and shells), homogeneous
			183.5-188.5		Advanced 3 1/2" Ch Tricone Roller Bit;
					uniform resistance; easy drilling,
					drilling fluid olive gray, cuttings
					observed are clumps of sand, silt,
					f. sand
S-56	1/8"	4474/6	188.5-190.0	-119.2	SIFTY SAND (Sm), f. sand, wet,
					olive gray, est 45% shells (f. sand
					highly discrete ^{discrete}
					size, extremely ^{extremely} weathered, weak HCL
					reaction (with soil and shells), homogeneous

 Schnabel Engineering	FIELD BORING LOG	GCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(Q or N)	Boring No: <u>B-345</u> Sheet <u>34</u> of <u>45</u>
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) Drilling Equipment Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="font-size: small; text-align: center;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="width: 20%;">Type of Reading*</th> <th style="width: 15%;">Date</th> <th style="width: 15%;">Depth</th> <th style="width: 15%;">Casing</th> <th style="width: 35%;">Caved</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																								
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Type of Reading*	Date	Depth	Casing	Caved																																																				

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Reco. (in.)	Blow Counts / PP Data			
			100.5-123.5		Advanced 3 1/2" Oil Tricone Roller Bit; uniform resistance, smooth drilling, drilling fluid olive gray, cuttings observed are SILTY SAND, f. sand.
S-57	18"	5+7H	193.5-195.0	-124.2	SILTY SAND (SM), f. sand, wet, olive gray highly est 65% shells (f. sand size, heavily weathered). Weak HCl reaction (with soil and shells), homogeneous.
			193.5-198.5		Advanced 3 1/2" Oil Tricone Roller Bit. Uniform resistance, smooth drilling, drilling fluid olive gray, cuttings observed are silty sand, f. sand.
			198.5		Driller de-sanded 150 gallons of drilling fluid, driller added ~25 gallons to drilling fluid. Driller flushed hole with new drilling fluid.

		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048	(Q or N)	Boring No: <u>B-345</u> Sheet <u>37</u> of <u>38</u>
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="text-align: center;">Type of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																			
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Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
S-58	18"	4+8+10	198.5-200.0	-129.2	SILTY SAND (SM), f. sand, wet, olive gray, weak HCl reaction, homogeneous
			198.5-203.5		Advanced 3 1/2" ON Tricone Roller Bit; smooth drilling, easy drilling, uniform resistance, drilling fluid olive gray, cuttings observed are silty sand, f. sand
S-59	18"	7+8+13	203.5-205.0	-134.2	SILTY SAND (SM), f. sand, wet, olive gray, est 55% shells (f. to med highly weathered) sand size, moderately to finely weathered weak HCl reaction (with soil and shells), homogeneous
			203.5-208.5		Advanced 3 1/2" ON Tricone Roller Bit; uniform resistance, smooth drilling, drilling fluid olive gray, cuttings observed are silty sand f. sand
			208.5		Marsh funnel test taken (41 sec drilling fluid)

		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 05120048	(Q or N)	Boring No: <u>B-345</u> Sheet <u>2</u> of <u>25</u>
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) _____ Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): <u> </u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="text-align: center;">Type of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																								
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Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
5-60	18"	7-9-12	208.5 - 210.0	-139.2	SANDY SAND (SM), f. sand, moist; Olive gray, est. 25% shells (f. highly weathered), weak HCl reaction (with soil and shells), homogeneous 208.5 - 213.5 Advanced 3 1/2" OD Tricone Roller Bit; uniform resistance, smooth drilling, drilling fluid olive gray, cuttings observed are silty sand, f. sand
5-61	18"	6-10-12	213.5 - 215.0	-144.2	SANDY SPT (MC), f. sand, moist; Olive gray, est. 25% shells (f. highly weathered), weak HCl reaction (with soil and shells), firm, homogeneous 213.5 - 218.5 Advanced 3 1/2" OD Tricone Roller Bit; uniform resistance, smooth drilling, drilling fluid olive gray, cuttings observed are silty sand, f. sand.

FIELD
BORING
LOGCCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Q or M)

Boring No: B-245

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Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Red Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PR Data			

362 18" 61911 218.5-220.0 149.2 SAND SILT (ML), f. sand, moist,

Olive gray, est. 65% shells (f. sand
highly 8/15/08Silt, ~~extremely~~ weathered, weak HCL

Reaction (with soil and shells), firm

homogeneous

218.5-223.5

Advanced 3 1/2" OD Tricone Roller Bit;

Uniform Resistance, smooth drillings,

drilling fluid Olive gray, cuttings dispersed

All silt sand, f. sand

363 18" 61911 223.5-225.0 154.2 SAND SILT (ML), f. sand, moist, olive

gray, est. 65% shells (f. sand size,

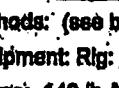
highly ~~extremely~~ weathered, weak HCL reaction

firm, homogeneous

End of Day drilling at 225.0 ft 8/5/00


8:15 pm

Dr. ~~in~~ end of Day water level reading

 Schnabel Engineering	FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048	(Q or N)	Boring No: B-345 Sheet 12 of 45
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates: Started: _____ Finished: _____ Location: Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="text-align: center;">Type of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																			
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(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*																																																			
Type of Reading*	Date	Depth	Casing	Caved																																															

Testing / Sampling					Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Flow. Counts / PP Data	Depth Interval (ft)	Elev. (ft)	
					START of Day. Drilling at 225.0ft 8/6/08
			223.5 - 228.5		7:15 Am ; Driller took start of day water reading
			223.5		Advanced 3 1/2" OD Triane Roller Bit ;
					Driller emptied mud tub of All drilling fluid (too thick to pump) , Driller mixed 20 bags of bentonite with 150 gallons of water (Drilling fluid)
			228.5 - 228.5		Driller Advanced 3 1/2" OD Triane Roller Bit ;
					Uniform Resistance, Smooth drilling, drilling fluid light gray, Cuttings observed are clumps of silt/sand, f. sand
S-64 1/8"	6+104HS		228.5 - 230.0	-159.2	SANDY SILT (ML), f. sand, moist, blue gray, est 65% shells (f. sand highly calcareous, silty, weathered), no HCl reaction (with soil), weak HCl reaction (with shells), firm, homogeneous

	FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 08120048	(Q or N)	Boring No: <u>B-395</u>
				Sheet <u>23</u> of <u>48</u>

Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	Groundwater Observations (Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion) <table border="1"> <thead> <tr> <th>Type of Reading</th> <th>Date</th> <th>Depth</th> <th>Casing</th> <th>Caved</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	Type of Reading	Date	Depth	Casing	Caved																																			
Type of Reading	Date	Depth	Casing	Caved																																					

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
			218.5 - 233.5		Advanced 3 1/2" OD Tricone Roller Bit; uniform resistance, smooth drilling, drilling fluid olive gray, cuttings observed are chips of silty sand, f. sand
S-65	18"	7+12+17	233.5 - 235.0	-164.2	SANDY SILT (MC), f. sand, moist, blue gray, est 45% shells (f. sand size, highly totally weathered), weak HCL reaction (with soil and shells), firm, homogeneous
			235.5 - 238.5		Advanced 3 1/2" OD Tricone Roller Bit; uniform resistance, slightly harder drilling, drilling fluid olive gray, cuttings observed are silty sand, f. sand
S-66	18"	7+13+19	238.5 - 240.0	-169.2	SANDY SILT (MC), f. sand, moist, olive gray, est 45% shells (f. sand size, totally highly weathered), weak HCL reaction (with soil and shells), firm, homogeneous

	FIELD BORING LOG	CCNPP Subsurface Investigation	(Q or N)	Boring No: <u>B-345</u>
		Calvert County, Maryland Project No. 05120048		Sheet <u>30</u> of <u>45</u>

Boring Contractor: _____
 Boring Foreman: _____
 Drilling Methods: (see below) _____
 Drilling Equipment: Rig: _____
 Hammer Type: 140-lb Auto Rod Size: _____
 Schnabel Representative: _____
 Dates Started: _____ Finished: _____
 Location: Northing: _____
 Easting: _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Ground Surface Elevation (ft): _____

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Req. (in.)	Flow Counts / PP Data			

			238.5-243.5		Advanced 3 1/2" OD Tricone Roller Bit;
					Uniform resistance, smooth drilling, drilling
					fluid olive gray, cuttings observed are
					silty sand, f. sand
567	18"	B-1014	243.5-245.0	-174.2	SANDY SILT (ML), f. sand, moist,
					olive gray, est 45% shells (f. sand
					highly dispersed
					size, extremely weathered), weak HCl
					reaction (with soil and shells), firm,
					homogeneous
			243.5-248.5		Advanced 3 1/2" OD Tricone Roller Bit;
					uniform resistance, smooth drilling,
					drilling fluid olive gray, cuttings
					observed are silty sand, f. sand
			248.5		Driller pumped out 150 gallons of
					drilling fluid and flushed the hole
					with 150 gallons of clean water

FIELD
BORING
LOGGCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Q or N)

Boring No: B-345

Sheet 45 of 48

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading* Data Depth Casing Cased

Testing / Sampling

Sample No. Rec. (in.) Blow Counts / PP Data

Depth Interval (ft)

Elev. (ft)

Material Unit Description / Drilling Method / Observations

S-68 18" 641015 248.5-250.0 -179.2 SANDY SILT (ML); f. sand, med, olive

gray, est 45% shells (f. sand size, highly ~~extremely~~ weathered), weak HCl reaction

(with soil and shells), firm, homogeneous

250.0

Bottom of Boring at 250.0 ft

Boring terminated at selected depth of 250.4

BORING WAS PROPERLY ^{KSA Blaken} ~~Reinforced~~ Backfilled

at completion per procedure

Test Boring Checklist

CCNPP 2008 Subsurface Investigation
Bechtel Job No. 25237
Schnabel Project No. 06120048

Test Boring No. B-346

Date: 7/1/08

Pre-Drill Check

Utility mark-out confirmed: Yes ☒ No ☐
Calibration of hammer verified: Yes ☒ No ☐
Location verified: Yes ☒ No ☐
Continuous sampling: 0 to 16 ft Yes ☒ No ☐
* Bottom 20 ft Yes ☐ No ☒
** Elevation +50 to -20 ft Yes ☐ No ☒
*** Entire Boring Yes ☐ No ☒

Notes: GPS stated elevation is 61.8 ft.

Hammer #3

Rod Size (circle one): AW (AWJ) NW / NWJ / Other ()

Pre-drill approval:

(signature/date)

Burt L. Carr 7/1/08
Donald DeFuria 7/1/08

Drilling Check

Was water, mud, or casing necessary to maintain hole integrity per procedure T01?

Yes ☒ No ☐ If yes, describe method used:

Mud

Split-spoon sampler correct size and in good condition? Yes ☒ No ☐
SPTs conducted in accordance with ASTM D1586? Yes ☒ No ☐
Thin-walled tubes correct size and in good condition? Yes ☐ No ☒ N/A
Samples labeled per procedure T01? Yes ☒ No ☐
Borehole abandoned per procedure T01? Yes ☐ No ☒

Drilling Summary

Describe drilling method(s) used: 4 1/4" I.D. HSA and 3 1/2" O.D. tricone roller bit (mud rotary)

Total depth of hole: 100.0

Drilling without sampling: N/A

No. cement bags for grouting: 2

No. UD samples: N/A

Deviations and Unusual Conditions

Prepared By:

Signature / Date

Donald DeFuria 7/1/08

(Schnabel Site Superintendent)


Approved By:

Signature / Date

Donald DeFuria 7/1/08

(Bechtel Site Superintendent)

LOG REVIEWED BY: PA 7/10/08

	FIELD BORING LOG	CCNPP Subsurface Investigation	(Q or N)	Boring No: B-346
		Calvert County, Maryland	Q	
		Project No. 08120048		Sheet 1 of 10

Boring Contractor: Connelly & AssociatesBoring Foreman: Tom Chew

Drilling Methods: (see below)

Drilling Equipment: Rig: Diedrich D-50 TurboHammer Type: 140-lb Auto Rod Size: AWSSchnabel Representative: Brandon GlessDates Started: 7/1/08 Finished: 7/1/08Location Northing: 217206.4Easting: 960400.4Ground Surface Elevation (ft): 61.8

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved
Encountered 11:27am	7/1/08	13.5	13.5	-
Completion 3:00pm	7/1/08	8.6	14.5	81.0

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
S-1	9	1+2+2	0.0-1.5	61.8	0.0-0.5 Organics (Topsoil, roots) POORLY GRADED SAND (sp), med. to c. sand, subangular, moist, brown, no HCl reaction
			0.0-2.5		Advanced 4 1/4" I.D. HSA: Uniform resistance, smooth drilling, brown cuttings; used pilot bit to clear augers
S-2	11	1+2+3	2.5-4.0	59.3	POORLY GRADED SAND (sp), med. to c. sand, subangular, moist, brown and light brown, est. < 5% f. gravel (subangular), contains roots, no HCl reaction
			2.5-5.0		Advanced 4 1/4" I.D. HSA: Uniform resistance, smooth drilling, brown cuttings, used pilot bit to clear augers
S-3	13	2+2+2	5.0-6.5	56.8	POORLY GRADED SAND (sp), med. to c. sand, subangular, moist, light brown, est. < 5% f. gravel (subangular) est. < 5% lean clay, no HCl reaction [Photograph for S-3 contains S-2 information]
			5.0-7.5		Advanced 4 1/4" I.D. HSA: Uniform resistance, smooth drilling, brown cuttings, used pilot bit to clear augers
S-4	11	6+10+10	7.5-9.0	54.3	POORLY GRADED SAND (sp), med. to c. sand,



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Q or N)

Boring No: B-346

Sheet 3 of 10

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
					subangular, moist, light gray and orangeish
					brown, est. < 5% f. gravel (angular), no
					HCl reaction
			7.5-10.0		Advanced 4 1/4" I.D. HSA: Uniform resistance,
					smooth drilling, brownish orange cuttings, used
					pilot bit to clear augers
S-5	18	1+2+3	10.0-11.5	51.8	SANDY LEAN CLAY (cl), f. sand, moist, light
					gray with mottles of ^{BG 7/1/08} brownish orange
					(oxidation), no HCl reaction, soft
			10.0-13.5		Advanced 4 1/4" I.D. HSA: Uniform resistance,
					smooth drilling, brownish orange cuttings
S-6		2+4+4	13.5-15.0	48.3	LEAN CLAY (cl), moist, dk gray, contains mica,
					no HCl reaction, firm
			13.5-14.5		Advanced 4 1/4" I.D. HSA: Uniform resistance,
					smooth drilling, brownish orange cuttings
			14.5		Switch from 4 1/4" I.D. HSA to 3 1/2" O.D.
					^{BG 7/1/08} tricone roller bit (mud rotary), at by one bag



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

Boring No: B-346

Sheet 3 of 10

Boring Contractor: _____
Boring Foreman: _____
Drilling Methods: (see below)
Drilling Equipment: Rig: _____
Hammer Type: 140-lb Auto Rod Size: _____
Schnabel Representative: _____
Dates Started: _____ Finished: _____
Location Northing: _____
Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (In.)	Blow Counts / PP Data			
					of bentonite mixed with 125 gallons of water
					for mud mix.
					3 1/2" O.D. @ 7/10/08
			14.5 - 18.5		Advanced Tricone bit: Uniform resistance, smooth drilling, gray fluid.
5-7	18	4+8+11	18.5 - 20.0	43.3	LEAN CLAY (cl), moist, dk gray, contains mica,
					no HCl reaction, Firm
					3 1/2" O.D. @ 7/10/08
			18.5 - 23.5		Advanced Tricone bit: Uniform resistance, smooth drilling, gray fluid.
5-8	18	7+10+15	23.5 - 25.0	38.3	(23.5 - 24.0 jar labeled as S-8A)
					LEAN CLAY (cl), moist, dk gray, contains mica,
					no HCl reaction, Firm
					(24.0 - 25.0 jar labeled as S-8B)
					POORLY GRADED SAND WITH SILT (sp-sm), F. sand,
					moist, dk gray, no HCl reaction
					3 1/2" O.D. @ 7/10/08
			23.5 - 28.5		Advanced Tricone bit: Increasing resistance with depth through 5 ft drilling interval, gray fluid, added mud thinner at 25.0 ft.
5-9	19	50/5	28.5 - 29.4	33.3	POORLY GRADED SAND WITH SILT (sp-sm), F. sand,

FIELD
BORING
LOGCCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

Boring No: B-346

Sheet 4 of 10

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
					wet, dk. gray, est 5-10% fresh shell fragments (c. sand to f. gravel size), weak HCl reaction (with shells), no HCl reaction (with soil) 3 1/2" O.D. @ 7/16" B
			28.5-33.5		Advanced Africone bit: Increasing resistance with depth through drilling interval, gray fluid drilling @ 7/16" B
S-10	14	15-26-25	33.5-35.0	28.3	POORLY GRADED SAND WITH SILT (SP-SM), f. to med. sand, wet, light gray, est. 5-10% fresh shell fragments (c. sand to med. gravel size), strong HCl reaction (with shells), strong HCl reaction (with soil) 3 1/2" O.D. @ 7/16" B
			33.5-38.5		Advanced Africone bit: Uniform resistance, smooth drilling, gray fluid drilling @ 7/16" B BG 71169
S-11		9-7-7	38.5-40.0	23.3	(S-11A jar (38.5-39.0 jar labeled as S-11A)) POORLY GRADED SAND WITH SILT (SP-SM), f. sand, wet, gray, est. 15-25% fresh shell fragments (c. sand to med. gravel size), strong HCl reaction (with shells), strong HCl reaction (with



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 08120048

(Q or N)

Boring No: B-346

Sheet 5 of 10

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
					soil)
					(39.0-40.0 jar labeled as S-11B)
					LEAN CLAY (cl), moist, dk gray, est. < 5% f.
					f. sand, est. < 5% fresh shell fragments,
					contains mica, strong HCl reaction (with shells)
					strong HCl reaction (with soil), firm
					3 1/2" O.D. 7/16" 7/16"
			39.5-43.5		Advanced Africane bit: Uniform resistance,
					drilling 7/16" 7/16"
					smooth drilling, gray fluid
S-12	18	3+8+00	43.5-45.0	18.3	LEAN CLAY (cl), moist, dk gray, est < 5% f.
					sand, est. < 5% moderately weathered shell
					fragments (f. gravel size), strong HCl reaction
					(with shells), weak HCl reaction (with soil)
					3 1/2" O.D. 9/16" 9/16"
			43.5-48.5		Advanced Africane bit: Bit chatter from 46.0
					drilling 7/16" 7/16"
					to 48.0 ft, gray fluid
S-13	19	7+5+12	48.5-50.0	13.3	POORLY GRADED SAND WITH SILT (sp-sm), f.
					sand, wet, gray, est. < 5% fresh shell
					fragments (f. to med. gravel size), strong HCl

FIELD
BORING
LOGCCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or M)

Boring No: B-346

Sheet 6 of 12

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*


Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)
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Material Unit Description / Drilling Method / Observations

					reaction (with shells), weak HCl reaction (with soil) 3 1/2" O.D. 7/1/08
			48.5-53.5		Advanced Atricone bit: Uniform resistance, smooth drilling, gray fluid 7/1/08
S-14	4	3+5+6	53.5-55.0	8.3	POORLY GRADED SAND WITH SILT (SP-SM), F. sand, wet, dk gray, est. 15-25% fresh shell fragments (f. gravel size), strong HCl reaction (with shells), weak HCl reaction (with soil) 3 1/2" O.D. 7/1/08
			53.5-58.5		Advanced Atricone bit: Uniform resistance, smooth drilling, gray fluid 7/1/08
S-15	10	27+15+12	58.5-60.0	3.3	POORLY GRADED SAND (SP), F. to med. sand, wet, dk gray, est. < 5% highly weathered shell fragments (c. sand to med. gravel size), contains 5-10% fine to med. gravel (as fragments) cemented sands, strong HCl reaction (with shells) 3 1/2" O.D. 7/1/08
			58.5-63.5		Advanced Atricone bit: Uniform resistance,

		FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048	(Q or N)	Boring No: B-346 Sheet <u>7</u> of <u>46</u>
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) Drilling Equipment Rtg: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="text-align: center;">Type of Reading*</th> <th style="text-align: center;">Date</th> <th style="text-align: center;">Depth</th> <th style="text-align: center;">Casing</th> <th style="text-align: center;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing	Caved																																			
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Type of Reading*	Date	Depth	Casing	Caved																																															

Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
					drilling 7/1/08
					smooth drilling, gray ^h fluid
S-16	18	5+5+10	63.5-65.0	-1.7	POORLY GRADED SAND WITH SILT (SP-SM),
					f. to med. sand, wet, dk gray, est. < 5%
					highly weathered shell fragments (c. sand to f.
					BA 7/1/08
					gravel size, weak HCl reaction (with shells), no
					HCl reaction (with soil)
					3 1/2" O.D. 7/1/08
			63.5-68.5		Advanced Tricone bit: Uniform resistance,
					drilling 7/1/08
					smooth drilling, gray ^h fluid
S-17		5+6+8	68.5-70.6	-6.7	SILTY SAND (SM), f. to med. sand, wet,
					dk gray, est. < 5% highly weathered shell
					fragments (f. gravel size), strong HCl reaction
					(with shells), weak HCl reaction (with soil)
					3 1/2" O.D. 7/1/08
			68.5-73.5		Advanced Tricone bit: Uniform resistance,
					drilling 7/1/08
					smooth drilling, gray ^h fluid
S-18	18	7+11+18	73.5-76.0	-11.7	SILTY SAND (SM), f. to med. sand, wet, est.
					5-10% moderately to highly weathered shell
					fragments (c. sand to f. gravel size), strong



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

Boring No: B-346

Sheet 8 of 10

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____


Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved

Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data	Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
					HCl reaction (with shells), weak HCl
					reaction (with soil)
					3 1/2" O.D. 7/19/08
			73.5-78.5		Advanced Atricone bit: Bit chatter from 76.0
					to 78.5 ft (shells)
5-19	86 7 1/8	8:7:31	78.5-80.0	-16.7	CLAYEY SAND (SC), f. to med. sand, wet, dk gray,
					est. 15-25% Fresh shell fragments (f. to med. gravel
					size), contains a 2 inch layer of f. to c. gravel
					(as cemented sands) at 79.8 feet, strong HCl
					reaction (with shells), strong HCl reaction
					(with soil)
					3 1/2" O.D. 7/19/08
			78.5-83.5		Advanced Atricone bit: Uniform resistance,
					drilling 7/19/08
					smooth drilling, gray fluid
6-20	18	7:10:15	83.5-85.0	-21.7	POORLY GRADED SAND WITH SILT (SP-SM), f.
					sand, wet, dk gray, est. < 5% highly weathered
					shell fragments (f. gravel size), weak HCl
					reaction (with shells), weak HCl reaction (with
					soil.)

 Schnabel Engineering	FIELD BORING LOG	CCNPP Subsurface Investigation Calvert County, Maryland Project No. 06120048	(Q or N)	Boring No: B-346 Sheet 9 of 10
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Boring Contractor: _____ Boring Foreman: _____ Drilling Methods: (see below) Drilling Equipment: Rig: _____ Hammer Type: 140-lb Auto Rod Size: _____ Schnabel Representative: _____ Dates Started: _____ Finished: _____ Location Northing: _____ Easting: _____ Ground Surface Elevation (ft): _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Groundwater Observations</th> </tr> <tr> <th colspan="5" style="text-align: center;">(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*</th> </tr> <tr> <th style="width: 30%;">Type of Reading*</th> <th style="width: 15%;">Date</th> <th style="width: 15%;">Depth</th> <th style="width: 15%;">Casing:</th> <th style="width: 25%;">Caved</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Groundwater Observations					(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*					Type of Reading*	Date	Depth	Casing:	Caved																																			
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Testing / Sampling			Depth Interval (ft)	Elev. (ft)	Material Unit Description / Drilling Method / Observations
Sample No.	Rec. (in.)	Blow Counts / PP Data			
			83.5 - 88.5		Advanced Aircone bit: Uniform resistance, smooth drilling, gray fluid
5-21	18	10-11-10	88.5 - 90.0	-26.7	LEAN CLAY with sand (cc), F. sand, moist, dk gray, est. < 5% highly weathered shell fragments (med. to c. sand size), strong HCl reaction (with shells), strong HCl reaction (with soil), Firm
			88.5 - 93.5		Advanced Aircone bit: Uniform resistance, smooth drilling, gray fluid
5-22	5-8-11	93.5 - 95.0	93.5 - 95.0	-31.7	POORLY GRADED SAND WITH SILT (SP-SM), F. sand, moist, dk gray, est. < 5% moderately weathered shell fragments (c. sand to med. P. gravel size), strong HCl reaction (with shells), weak HCl reaction (with soil)
			93.5 - 98.5		Advanced Aircone bit: Uniform resistance, smooth drilling, gray fluid



FIELD
BORING
LOG

CCNPP Subsurface Investigation
Calvert County, Maryland
Project No. 06120048

(Q or N)

Boring No: **B-346**

Sheet **10** of **10**

Boring Contractor: _____

Boring Foreman: _____

Drilling Methods: (see below)

Drilling Equipment: Rig: _____

Hammer Type: 140-lb Auto Rod Size: _____

Schnabel Representative: _____

Dates Started: _____ Finished: _____

Location Northing: _____

Easting: _____

Ground Surface Elevation (ft): _____

Groundwater Observations

(Encountered, During Drilling, End of Day, Start of Day, Casing Pulled, Completion)*

Type of Reading*	Date	Depth	Casing	Caved
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Testing / Sampling

Sample No.	Rec. (in.)	Blow Counts / PP Data
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Depth Interval (ft)

Elev. (ft)

Material Unit Description / Drilling Method / Observations
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5-23	18	9-9+12	98.5-100.0	-36.7	SILTY SAND (sm), f. sand, med. dk. gray;
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weak HCl reaction

Bottom of boring at 100.0 ft

Boring backfilled with bentonite and
cement grout using a tremie upon
completion