GEOTECHNICAL SUBSURFACE INVESTIGATION DATA REPORT

CGG Combined Operating License (COL) Project – Phase 2
Calvert Cliffs Nuclear Power Plant
Calvert County, Maryland

February 19, 2009

Prepared By:

SCHNABEL ENGINEERING, LLC
Gaithersburg, Maryland
(Schnabel Project No. 06120048)

Submitted To:

BECHTEL POWER CORPORATION
Frederick, Maryland
(Bechtel Subcontract No. 25237-103-HC4-CY00-00001)

Binder No. 1 of 2

Including:

Report Text
Appendix A: Summary Tables
Appendix B: Underground Utility Detection
Appendix C: SPT Borings

Schnabel
Schnabel Engineering, LLC

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February 19, 2009

Mr. Scott Close
Bechtel Power Corporation
5275 Westview Drive
Frederick, MD 21703-8306

Subject: **Geotechnical Subsurface Investigation Data Report, CGG Combined Operating License (COL) Project – Phase 2, Calvert Cliffs Nuclear Power Plant, Calvert County, Maryland**
Subcontract No. 25237-103-HC4-CY00-00001
(Schnabel Project No. 06120048)

Dear Mr. Close:

Schnabel Engineering, LLC (Schnabel) is pleased to submit this Geotechnical Subsurface Investigation Data Report for the above referenced project. This data report contains subsurface information Schnabel collected for this project and a summary of the equipment and methods used. This report focuses on the subsurface data collected on behalf of Bechtel Power Corporation (Bechtel) to support the Combined Operating License (COL) process for a proposed new nuclear reactor (Unit 3) at the Calvert Cliffs Nuclear Power Plant (CCNPP) site.

A previous COL subsurface investigation (Phase 1) was performed by Schnabel in 2006. The COL subsurface data previously collected by Schnabel are presented in the following reports:

- Geotechnical Subsurface Investigation Data Report (Revision No. 1), dated April 13, 2007
- Geotechnical Subsurface Investigation Data Report Addendum No. 3 (RCTS Test Results) – Rev. 02, dated December 13, 2007

This report has been prepared in accordance with the Technical Services Subcontract agreement between Bechtel and Schnabel, dated March 23, 2006, and subsequent Change Orders.

Sampling and testing activities for this project were performed under Bechtel's quality assurance program meeting NQA-1 requirements, and according to the pre-approved project technical specification, technical procedures and work plans.

We appreciate the opportunity to be of service to you for this project. Please contact Mr. Brian Banks at (301) 417-2400 if you have any questions regarding this report.

Very truly yours,

SCHNABEL ENGINEERING, LLC

Brian K. Banks, P.G.
Senior Associate

George Wirth, P.E.
Principal

"Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 16138, Expiration Date: 10/8/09."

BB/bb/oa
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1.0 INTRODUCTION

In 2006 and 2007, Schnabel Engineering, LLC (Schnabel) performed a geotechnical subsurface investigation under the direction of Bechtel Power Corporation (Bechtel) to support the Combined Construction and Operation License (COL). Schnabel performed a second phase of subsurface investigation in 2008 to provide continuing support to Bechtel for the COL process. This geotechnical data report includes the results of the Phase 2 COL subsurface investigation.

1.1 Site Description

The project site is located adjacent to the existing Calvert Cliffs Nuclear Power Plant (CCNPP). The site is bordered by the CCNPP to the north and by Calvert Cliffs along the western shores of the Chesapeake Bay to the east.

The site includes the land currently occupied by "Camp Canoy", a lightly developed recreational facility with a few small, widely-spaced buildings and shelters; a baseball field; tennis courts; a pool; a small, earth-dam pond; paved and un-paved access roads; and utilities.

The majority of the site is wooded with small to large trees and a thin understory of brush and vines, except for some open grassy areas in Camp Canoy. The topography generally consists of gently to moderately sloped terrain, although some areas exhibit steep slopes. Streams and wetland areas occupy many of the topographic lows. Wetland areas were also found at intermediate levels on some of the slopes.

1.2 Scope of Work

The scope of our work as defined by Exhibit D, Scope of Work (25237-103-Y05-CY00-5400) and Technical Specification (25237-103-3PS-CY00-00001) of the Technical Services Subcontract between Bechtel and Schnabel included performing field testing and sampling, providing quality control surveillances during field activities, and preparing this data report. Specifically, the following field testing scope items were performed during the Phase 2 subsurface investigation:

- Surveying to establish the horizontal and vertical locations of subsurface exploration points.
- Detecting underground utilities at subsurface exploration points.

- Drilling 48 standard penetration test (SPT) borings to depths up to 350 ft, and collection of disturbed SPT and undisturbed tube soil samples.

- Installation and development of seven groundwater observation wells to depths up to 103 ft.

- Permeability testing in five wells screened below groundwater levels.

- Groundwater sampling in 15 wells screened below groundwater levels.

- Performing 11 cone penetration test soundings, some including shear wave and/or pore water pressure dissipation measurements, to depths up to 152.2 ft with pre-drilling.

- Performing borehole geophysical logging including natural gamma, long- and short-normal resistivity, spontaneous potential, three-arm caliper, direction survey, and P-S velocity logging in three SPT borings.

- Dilatometer testing, including shear wave and pore water pressure dissipation measurements, to depths up to 350 ft with predrilling.

- Pressuremeter testing in two borings to depths up to 361 ft.

- Conducting SPT hammer energy testing for each of the five hammer-rod combinations used.

This data report, prepared to convey information collected during the subsurface investigation, includes the following:

- Calibrated field equipment used
- As-built exploration point survey data
- Underground utility conflicts
- SPT boring logs
- Cone penetration test results
- Observation well logs
- Field permeability test results
- Dilatometer testing results
- Pressuremeter testing results
- Borehole geophysical logging results
- SPT hammer energy study results

Soils laboratory testing for Phase 2 was performed by others under Bechtel's direction. The Phase 2 soils laboratory testing results, by others, including natural moisture content,

grain size distribution and Atterberg limits are incorporated into our boring logs. Services with respect to providing engineering analyses and recommendations, approval of testing locations, environmental assessments, and wetlands identification are not included in our scope of services.

2.0 FIELD TESTING AND SAMPLING

Subsurface investigation field activities were performed between May 13, 2008 and January 26, 2009, except for ongoing groundwater sampling. All field testing and sample collection was performed in accordance with the Technical Specification (25237-103-3PS-CY00-00001) and applicable technical procedures and work plans established for this project. The calibrated field equipment used during field testing and sampling activities is provided as Table A.1 in Appendix A. A list of subcontractors that assisted Schnabel with field testing and sampling activities is provided as Table A.3 in Appendix A.

The subsurface exploration test locations were planned by Bechtel personnel and presented to us on the Subsurface Investigation Location Plan (Drawings 25237-000-CY-0000-00004 and 25237-000-CY-0000-00005). Each planned test location was staked in the field in advance of the associated testing activity. Offsets from the planned locations were sometimes necessary to avoid obstructions (e.g., steep slopes, large trees, wetland buffers, underground utilities, etc.). Offset locations were approved by Bechtel personnel in advance of testing.

2.1 Surveying Services

Surveying services included both an initial stakeout prior to testing and an as-built survey after testing. The originally planned subsurface exploration point locations (i.e., northing and easting) were staked in the field during the initial stakeout. The follow-up survey was performed after completion of field testing activities to determine the as-built locations for subsurface exploration points offset from their originally planned locations. A summary of the as-built subsurface exploration point locations is provided as Table A.2 in Appendix A.

2.2 Underground Utility Detection

Underground utility detection activities were performed by A. Morton Thomas, Inc, and Insight, LLC, to investigate for the presence of underground utilities at each subsurface exploration point location. Surface geophysical techniques were used to determine the existence of all existing utilities within 10 ft of each boring location. This investigation included both inductive and passive sweeps at each boring location. Inductive sweeps are performed by two technicians, one holding the 82 kHz transmitter and the other holding the receiver. The two technicians walk in a coordinated grid pattern across the boring area such that any buried conductors can be first located and then traced one by one. The passive sweep detects the current in the utility which generates electromagnetic fields in

the environment such as those generated by power lines (50 or 60 Hz) and those generated by communications cables (RF).

Underground utilities were detected by these methods at nine COL boring locations as indicated on the Daily Summary for Underground Utility Location forms included in Appendix B. The utilities were marked in the field per applicable project procedures. When underground utility conflicts were detected, subsurface exploration point locations were offset to avoid underground utilities. The utility locating crew repeated the utility clearance at each offset test location.

2.3 Standard Penetration Testing (SPT) Drilling and Sampling

A total of 48 SPT borings were performed for this phase of work to depths up to 350 ft. Schnabel personnel provided field observation of SPT boring activities and logged each boring during drilling. General notes and field description sheets summarizing the methods and procedures used, as well as the SPT boring logs are presented in Appendix C. Five drilling rigs equipped with automatic SPT hammers were used to advance the borings, including:

1. CME 75 (ATV-mounted)
2. CME 75 (truck-mounted)
3. CME 550-X (ATV-mounted)
4. Diedrich D50 (ATV-mounted)
5. Failing 1500 (truck-mounted)

Borings were advanced using primarily mud rotary techniques, although hollow-stem augers were used as casing in the upper portions of some borings. Details about the drilling tools used for each boring are included on the boring logs. The drilling mud, consisting of a weighted bentonite-water mixture, was used to stabilize the borehole walls and to facilitate sediment removal during drilling. Clean water was used during drilling. The drilling water was brought in from off site and stored in an on-site water tank.

Standard penetration testing (ASTM D 1586) was generally conducted at a regular spacing of one test every 5 ft. However, tests were conducted every 2.5 ft in the upper 15 ft of each boring and in other intervals where required as shown on the boring logs in Appendix C. Pocket penetrometer measurements were collected on the exposed bottom portion of selected cohesive undisturbed tube samples. SPT and pocket penetrometer results are included on the boring logs in Appendix C.

Soil sampling in SPT borings included collecting disturbed SPT samples and undisturbed tube samples. SPT split-spoon samples retrieved at each SPT interval were visually described and classified in the field by a Schnabel geologist. A representative portion of each recovered split-spoon sample was placed in a glass sample jar sealed with a moisture-proof lid. Photographs of the split-spoon samples obtained in the field are provided in Appendix C. Undisturbed tube samples were collected at selected intervals between SPT intervals. A few borings were advanced only to collect undisturbed tube (UD) samples and did not include SPT samples. The methods used to collect UD samples, including Shelby tubes and Pitcher sampling, were selected based on geologic conditions. Pitcher sampling was used where the soil was too firm for pushing Shelby tubes. When possible, the exposed bottom portion of each recovered tube sample was visually described and classified in the field by a Schnabel geologist before the tubes were capped and sealed with wax.

SPT borings were backfilled with bentonite-cement grout using a tremie-pipe to displace drilling mud during grout placement unless otherwise approved by Bechtel. A note indicating whether a boring was sealed with grout is included on each boring log.

2.4 Well Installation

A total of seven groundwater observation wells were installed to depths up to 103 ft. Schnabel personnel provided observed well installation activities and prepared a well construction field log during well installation. Wells were typically installed about 10 ft away from the SPT "companion" boring. The well borings were advance using 6 ¼-inch inside diameter hollow-stem augers.

Well construction logs are presented in Appendix D. Groundwater observation wells were constructed using 2-inch diameter schedule 40 PVC riser casing; 10-ft long, ten-slot (0.01-inch), machine-cut PVC screen; and a 2-ft long sump made of blank casing capped on the bottom. Centralizers were placed above and below the screen interval. Filter pack sand consisting of clean, well-graded sand was placed around the sump and screen intervals, and at least 2 ft above the top of the screen. A bentonite seal at least 3 ft thick was placed above the filter pack. The annular space around the riser casing above the bentonite seal was backfilled with cement-bentonite grout. A protective steel well cover, locking cap, and concrete surface seal were installed for each well.

Each well was developed by pumping and/or flushing with clean water to remove sediment from the well and filter pack prior to field permeability testing. The duration

and extent of well development was determined by Bechtel field personnel. However, in general development was carried out until the well water appeared clear.

2.5 Field Permeability Testing

Schnabel personnel performed field permeability testing in groundwater observation wells in November and December, 2008. Tests were performed in five of the seven wells installed in the Phase 2 subsurface investigation. Two of the seven groundwater observation wells installed during this phase of subsurface investigation (OW-778 and OW-779) were not tested because they were found to be dry. Permeability testing results and analysis documentation are presented in Appendix D.

We conducted falling- and rising-head slug tests in accordance with Section 8 of ASTM D 4044. A falling-head slug test is a test method in which an object of known volume (i.e., a "slug") is lowered into a well to induce a sudden rise in water level in the well. Water in the well is subsequently forced out into the surrounding aquifer due to an increase in water pressure at a rate proportional to the hydraulic conductivity of the aquifer. Similarly a rising-head slug test involves the removal of a slug from the well, causing a decline in water level in the well. Water in the well is subsequently drawn into the well from the surrounding aquifer at a rate proportional to the hydraulic conductivity of the aquifer. The water level response is measured as the water level recovers to the pre-test level. The water level response curve is evaluated and analyzed to estimate hydraulic conductivity of the aquifer materials near the well.

The permeability testing at each well included measurement of pre-test water level, measurement of the pre-test water level trend, and performance of a falling-head and then a rising-head test. Equipment used included a mechanical slug, an In-Situ Level Troll 700 pressure transducer/datalogger, an In-Situ Rugged Reader for controlling the datalogger and downloading data, vented data cable, and a Solinst electric water level meter. The mechanical slug used was approximately 5-ft long, 1 ¼-inch external diameter PVC pipe filled with sand and sealed to prevent water from entering the slug during testing. We recorded a pre-test water level for each well using the Solinst manual water level meter. The water level response during testing was measured with the data logger linked to the Rugged Reader via the vented data cable.

Prior to conducting the falling-head test at each well, we obtained the pre-test water level trend. The pre-test trend in OW-304 and OW-308 reflected a static water level over the duration of the approximately 1-hour long pre-test. For OW-774A, OW-774B and OW-

781, an approximately 24-hour long pre-test was performed to measure the change in water level in the wells due to tidal fluctuations prior to permeability testing.

To conduct the falling-head test, we quickly inserted the slug in the well to suddenly raise the water level in the well. Care was taken to completely submerge the slug below the pre-test water level. The slug was submerged at least 2 ft below the static water level. The Level Troll recorded the water level response during recovery of the water level as it approached the pre-test water level to define the water level response curve. The datalogger was programmed to record the water level measurements every 2 seconds until the conclusion of testing, with readings starting prior to insertion of the slug.

To conduct the rising-head test, we quickly removed the slug from the well to cause a sudden decline in the water level. The datalogger recorded the water level response during recovery to define the water level response curve. The datalogger was programmed to record the water level measurements every 2 seconds until the conclusion of testing, with readings starting prior to removal of the slug.

The duration of the falling and rising head tests varied from less than an hour to several hours, depending on the time it took for the water levels to recover to a sufficient level to establish an asymptotic data trend for the water level response curve. We ended the test when the water level recovered to within about 0.3 ft of the pre-test water levels, between about 80 to 98 percent recovery.

2.6 Hydraulic Conductivity Analysis

Hydraulic conductivity analysis was performed for each set of permeability test data using AQTESOLV aquifer test software (version 4.5) by HydroSOLVE, Inc. We reviewed various analytical solutions available in AQTESOLV for the well and subsurface conditions at the site (i.e., partially or fully penetrating into aquifers of interest, confined vs. unconfined aquifer conditions, etc.). Solutions reviewed included the Cooper-Bredenhoeft-Papadolpulos (1967), Bouwer-Rice (1976), Hvorslev (1951) and KGS (1994) models. The KGS solution was selected for the test analyses because of its ability to analyze for the range of conditions in the wells and at the site, including partially penetrating wells in both confined and unconfined conditions.

In addition to the water level changes during the test, the KGS model requires input for the pre-test static water level, the top and bottom of the aquifer in which the well is screened, and the screen length. This aquifer and well information were available on the Test Boring Logs and the Well Construction Logs prepared for this project. The water

level changes from the permeability test were downloaded from the In-Situ Level Troll datalogger and imported into AQTESOLV. Input parameters for the AQTESOLV analysis (the parameters derived from the static water level, depth to top and bottom of aquifer, screen length, casing and well radius, and radius of influence) are listed on the individual AQTESOLV test result sheets included in Appendix D. For the purpose of our analyses, we used input parameters provided to us by Bechtel as instructed. Table 1 provides a summary of input parameters provided to us:

Table 1: Hydraulic Conductivity Analysis Input Parameters

Location	Static Water Column Height (H, ft)	Effective Screen Length (ft)	Aquifer Saturated Thickness (b, ft)	Distance from Top of Screen to Top of Aquifer (d, ft)
OW-304	34.72	10.00	22.00	4.22
OW-308	23.64	2.55	19.00	0.00
OW-774A	5.16	2.70	5.16	2.46
OW-774B	42.30	10.00	32.00	15.00
OW-781	42.38	8.00	15.30	0.00

Once the input parameters and water level data from the tests were input into AQTESOLV, the data was evaluated using the KGS method. The curve fit line was adjusted, as needed, to more closely fit the data and obtain the resulting hydraulic conductivity value. Results from other analytical methods (Bouwer and Rice, Cooper et al, and Hvorslev) and were found to be within one half of an order of magnitude of the KGS value. Based on our analysis of the pre-test, rising- and falling-head tests, it appears that tidal influences on wells OW-774A, OW-774B and OW-781 had no significant effect on the results of our conductivity analyses. No tidal influence was observed in OW-304 and OW-308.

The hydraulic conductivity estimated from the falling- and rising-head tests are summarized in Table 2. The reported values are for the test with the best fit solution curve for the tests performed on each well. Solution curves and diagnostic reports for each reported test are included in Appendix D. The hydraulic conductivity calculated from the KGS analyses are generally consistent with published values for similar soil types (Freeze and Cherry, 1979, Groundwater, Prentice Hall, 604p; Fetter, 2001, Applied Hydrogeology, 4th edition, Prentice Hall, 598p).

Table 2: Summary of 2008 Hydraulic Conductivity Results

Location	Screened Interval Depth (ft)	USCS Soil Type in Screened Interval	Selected Hydraulic Conductivity (cm/s)
OW-304	60 – 70	SM	$1.3x10^{-4}$
OW-308	90 – 100	SM, SC	$5.7x10^{-4}$
OW-774A	10 – 20	SC	$8.3x10^{-4}$
OW-774B	40 – 50	SM, SC-SM, SC, MH	$4.4x10^{-6}$
OW-781	40 – 50	SP-SM, SC, ML	$1.2x10^{-5}$

Note that wells OW-308, OW-774A and OW-781 have a 10-foot long screen at the depths indicated above. As these wells are partially screened within the aquifer based on the input parameters provided by Bechtel (Table 1), the effective screened lengths used in the AQTESOLV analyses were 2.55, 2.7 and 8 ft, respectively.

2.7 Groundwater Sampling

Groundwater samples were obtained from a total of 15 groundwater observation wells in two groundwater sampling events; Event 1: November 11, 2008 through November 13, 2008 and Event 2: January 19, 20 and 26, 2009 for laboratory analysis. The groundwater observation wells sampled include four wells installed during the Phase 2 subsurface investigation (OW-304, OW-308, OW-774A and OW-774B) and 11 wells previously installed during the Phase 1 subsurface investigation (OW-301, OW-313A, OW-319A, OW-319B, OW-323A, OW-328, OW-336, OW-423, OW-705, OW-754 and OW-756). The wells were purged prior to obtaining the groundwater samples. Water quality field parameters including pH, dissolved oxygen, electrical conductivity, oxidation-reduction potential, temperature, and turbidity were measured during purging in accordance with ASTM D 6452. Water sampling was also performed in accordance with ASTM D 6452 using a submersible pump placed below the water level in the well and above the screen interval, if possible. The well sampling records for each well and traceability records for each day of sampling are included in Appendix D. Laboratory testing on the groundwater samples was conducted by others.

2.8 CPT Soundings

ConeTec, Inc. completed a total of eight cone penetration test (CPT) soundings for this phase of work to depths up to 152.4 ft. CPT soundings included seismic and pore pressure dissipation testing at selected depth intervals. Many CPT soundings encountered

refusal above the target depths. Predrilling with hollow-stem augers or mud-rotary drilling was performed in several locations to penetrate refusal zones. Schnabel personnel provided field observation of CPT predrilling activities.

The ConeTec report, *Presentation of In Situ Testing Program Results (COL) Revision 1*, dated February 10, 2009, is presented in Appendix E. The ConeTec report includes a summary of the equipment and methods used as well as CPT test results (i.e., CPT logs, shear wave velocity data, and pore pressure dissipation curves).

2.9 Pressuremeter Testing

In Situ Engineering, Inc. completed a total of two pressuremeter (PM) test borings (PM-301 and PM-701) for this phase of the project to depths up to 361.0 ft between August 26, 2008 and September 12, 2008. The pressuremeter testing was performed in accordance with Technical Procedure No. T21 (25237-000-V14-CY00-00629-003) and Work Plan WP-T21 (25237-000-V14-CY00-00628-003).

PM testing was performed at select intervals, generally every 10 ft. The drilling and deployment of the PM was accomplished by GeoServices, Inc. using a CME 75 truck-mounted mud rotary rig. The pressuremeter instrument was a pre-bored monocell pressuremeter. Additional details including a summary of the equipment and methods used as well as the PM test results are included in the In Situ Engineering Report, *Final Report of In Situ Pressuremeter Geotechnical Testing (COL)*, dated February 13, 2009, provided in Appendix F.

2.10 Dilatometer Testing

Dilatometer (DMT) testing was performed by In-Situ Soil Testing, LLC at two locations for this phase of work to depths up to 350 ft below the ground surface. The dilatometer testing was performed in accordance with Technical Procedure T20 (25237-000-V14-CY00-00626-003) and Work Plan WP-T20 (25237-000-V14-CY00-00627-001).

DMT soundings included seismic and pore pressure dissipation testing at selected depth intervals. Both DMT soundings encountered refusal above the target depths. Predrilling with mud-rotary drilling was performed by GeoServices, Inc. to penetrate refusal zones. DMT testing was performed at select intervals, typically about once every 8 inches, or at least once every 1 ft. Dilatometer testing data provided by In-Situ Soil Testing is included in Appendix G.

2.11 Borehole Geophysical Logging

Geovision, Inc. performed borehole geophysical logging in a total of three SPT borings. Borehole geophysical methods included natural gamma, long- and short-normal resistivity, spontaneous potential, three-arm caliper, direction survey, and P-S velocity logging. The Geovision report, *Borehole Geophysical Logging Borings B-773, B-786B, and B-821A*, dated February 13, 2009, is presented in Appendix H. The Geovision report includes a summary of the equipment and methods used as well as the borehole geophysics test results.

2.12 SPT Hammer Energy Testing

GRL Engineers, Inc. performed SPT energy measurements, for each of the five SPT drilling rigs used for this project, to evaluate the energy transfer efficiency for each rig-hammer combination. The GRL reports, *Standard Penetration Test Energy Measurements Report* (July 25, 2008) and *Standard Penetration Test Energy Measurements Report #2* (September 25, 2008), are included in Appendix I. The GRL report presents a summary of the equipment and methods used as well as the results of the SPT hammer energy testing.

3.0 SOIL LABORATORY TESTING

Soil laboratory testing of select soil samples obtained in the field during this phase of work was performed by others. Tests were performed on disturbed SPT and undisturbed tube samples recovered from the SPT test borings. We understand the samples selected for testing were based on laboratory assignments provided by Bechtel personnel. Laboratory test results are presented separately. The boring logs in Appendix C include moisture content, grain size and Atterberg limits results. The Unified Soil Classification System (USCS) group names and group symbols shown on the logs are consistent with laboratory testing results.

APPENDIX A

SUMMARY TABLES

Table A.1: Equipment Calibration List
Table A.2: As-Built Subsurface Exploration Point Locations
Table A.3: Subcontractors

Table A.1
Equipment Calibration List

Table A.1
Equipment Calibration List
Constellation Generation Group (CGG) COL Project - Phase 2
Calvert Cliffs Nuclear Power Plant
Calvert County Maryland

ID No.	Bechtel Approved	Serial Number	Equipment Description	Equipment Use Description	Calibration Date	Calibration Due Date	Equipment Operator	Remarks	Company Performing Calibration	Nationally Recognized Standard followed (NIST, ASTM, ISO, etc.)	Calibration Company Accreditation (e.g. AMRL, NVLAP, A2LA)
A. Morton Thomas, Inc.											
1.001	CODE 1 7/8/08	030088RX, 40616TX	Metrotech 810	Subsurface pipe and cable locator sonde and receiver.	4/25/2008	4/25/2009	AMT	AMT; Calibration not required	MT Electronics	Manufacturers procedure	N/A
Connelly and Associates, Inc.											
2.001	CODE 1 7/8/08	1	Hammer Weight	SPT hammer for CMT style automatic hammer used to drive sampler into the ground.	4/8/2008	4/8/2010	CNL	Connelly hammer	National Certified Testing Laboratories	ISO/IEC 17025:2005	Equipment calibrated by Rogan, which is accreditated by Laboratory Accredation Bureau
2.002	CODE 1 7/8/08	2	Hammer Weight	SPT hammer for CMT style automatic hammer used to drive sampler into the ground.	4/8/2008	4/8/2010	CNL	Connelly hammer	National Certified Testing Laboratories	ISO/IEC 17025:2005	Equipment calibrated by Rogan, which is accreditated by Laboratory Accredation Bureau
2.003	CODE 1 7/8/08	3	Hammer Weight	SPT hammer for CMT style automatic hammer used to drive sampler into the ground.	4/8/2008	4/8/2010	CNL	Connelly hammer	National Certified Testing Laboratories	ISO/IEC 17025:2005	Equipment calibrated by Rogan, which is accreditated by Laboratory Accredation Bureau
2.004	CODE 1 7/8/08	4	Hammer Weight	SPT hammer for CMT style automatic hammer used to drive sampler into the ground.	6/30/2008	6/30/2010	CNL	Connelly Hammer	National Certified Testing Laboratories	ISO/IEC 17025:2005	Equipment calibrated by Rogan, which is accreditated by Laboratory Accredation Bureau
Collinson, Oliff & Associates, Inc.											
3.001	CODE 1 7/8/08	990609	Topcon GPT - 30002W	Total station optical transit for surveying	10/22/2007	10/22/2008	COA	COA; Survey Equipment (Hal Vaughan - Survey Chief)	Dicarlo Precision Instrument Incorporated	Topcon Factory specs	Authorized Topcon Dealer
GRL Engineers, Inc.											
4.001	CODE 1 7/8/08	K0288	Accelerometer	Used to measure impact and movement of the drill rods during SPT	6/11/2007	6/10/2009	GRL	GRL	Pile Dynamics, Inc.	PDI calibrates accelerometers to a "reference accelerometer" that they get from the manufacturer, PCB, that they calibrate all of the other accelerometers to.	The manufacturer, PCB, is A2LA certified, PDI is not.
4.002	CODE 1 7/8/08	K611	Accelerometer	Used to measure impact and movement of the drill rods during SPT	2/8/2008	2/7/2010	GRL	GRL	Pile Dynamics, Inc.	PDI calibrates accelerometers to a "reference accelerometer" that they get from the manufacturer, PCB, that they calibrate all of the other accelerometers to.	The manufacturer, PCB, is A2LA certified, PDI is not.
4.003	CODE 1 7/8/08	K0410	Accelerometer	Used to measure impact and movement of the drill rods during SPT	2/8/2008	2/7/2010	GRL	GRL	Pile Dynamics, Inc.	PDI calibrates accelerometers to a "reference accelerometer" that they get from the manufacturer, PCB, that they calibrate all of the	The manufacturer, PCB, is A2LA certified, PDI is not.
4.004	CODE 1 7/8/08	K0397	Accelerometer	Used to measure impact and movement of the drill rods during SPT	6/11/2007	6/10/2009	GRL	GRL	Pile Dynamics, Inc.	PDI calibrates accelerometers to a "reference accelerometer" that they get from the manufacturer, PCB, that they calibrate all of the	The manufacturer, PCB, is A2LA certified, PDI is not.
4.005	CODE 1 7/8/08	K0286	Accelerometer	Used to measure impact and movement of the drill rods during SPT	6/11/2007	6/10/2009	GRL	GRL	Pile Dynamics, Inc.	PDI calibrates accelerometers to a "reference accelerometer" that they get from the manufacturer, PCB, that they calibrate all of the	The manufacturer, PCB, is A2LA certified, PDI is not.
4.006	CODE 1 7/8/08	K0281	Accelerometer	Used to measure impact and movement of the drill rods during SPT	6/11/2007	6/10/2009	GRL	GRL	Pile Dynamics, Inc.	PDI calibrates accelerometers to a "reference accelerometer" that they get from the manufacturer, PCB, that they calibrate all of the other accelerometers to.	The manufacturer, PCB, is A2LA certified, PDI is not.
4.007	CODE 1 7/8/08	100AWJ	SPT Rod (2 strain gauges)	Short drill rod that is instrumented and placed in line with the drill rods and the SPT hammer to measure impact and movement.	11/12/2007	11/11/2009	GRL	GRL	Pile Dynamics, Inc.		
4.008	CODE 1 7/8/08	171AWJ	SPT Rod (2 strain gauges)	Short drill rod that is instrumented and placed in line with the drill rods and the SPT hammer to measure impact and movement.	7/26/2007	7/25/2009	GRL	GRL	Pile Dynamics, Inc.		

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ID No.	Bechtel Approved	Serial Number	Equipment Description	Equipment Use Description	Calibration Date	Calibration Due Date	Equipment Operator	Remarks	Company Performing Calibration	Nationally Recognized Standard followed (NIST, ASTM, ISO, etc.)	Calibration Company Accreditation (e.g. AMRL, NVLAP, A2LA)
4.015	CODE 1 8/27/08	40N3	SPT Rod	Short drill rod that is instrumented and placed in line with the drill rods and the SPT hammer to measure impact and movement.	8/15/2007	8/15/2009	GRL	GRL	Pile Dynamics, Inc.	PDI calibrates accelerometers to a "reference accelerometer" that they get from the manufacturer, PCB, that they calibrate all of the other accelerometers to.	The manufacturer, PCB, is A2LA certified, PDI is not.
4.016	CODE 2 10/20/08	1703K	Pile Driving Analyzer, Model PAK	Computer data logger and analyzer that connects to all accelerometers and records all data being measured.	1/3/2008		GRL		Pile Dynamics, Inc.	Pile Driving Analyzer is a proprietary instrument and was calibrated "using a PDA Calibration Box whose output was calibrated with test equipment traceable to NIST	PDI is not certified
Insight, LLC											
6.001	NA	17589	Metrotech Model 801 Cable & Pipe Locator	Subsurface pipe and cable locator sonde and receiver.	3/28/2008	3/28/2009	Insight	Utility Locating Equipment/ Not safety related / No Cal needed	MT Electronics (James Martin)	Manufacturers procedure	N/A
6.002	NA	24054	Metrotech Model 9890XT Cable & Pipe Locator	Subsurface pipe and cable locator sonde and receiver.	2/26/2008	2/26/2009	Insight	Utility Locating Equipment/ Not safety related / No Cal needed	MT Electronics (James Martin)	Manufacturers procedure	N/A
6.003	NA	1033055	Pipehorn Model 100 Cable & Pipe Locator	Subsurface pipe and cable locator sonde and receiver.	1/2/2008	1/2/2009	Insight	Utility Locating Equipment/ Not safety related / No Cal needed	MT Electronics (James Martin)	Manufacturers procedure	N/A
In Situ Engineering, Inc.											
7.001	CODE 1 7/9/08	HUG-001	Micrometer Head Model: N/A Range: Size: 0-1" X 0.001	precise measuring instrument used during pressuremeter calibration to measure change in pressuremeter diameter	1/28/2008	1/28/2009	InSitu Eng	InSitu Engineering pressuremeter equipment	Global Calibration Services	ISO 9001:200, ANSI/NCSL Z540-1, ISO/IEC 17025-2005, ISO 10012:2003	NQA ISO 9001 Registered, ANAB Accredited
7.002	CODE 1 7/9/08	HUG-002	Micrometer Head Model: N/A Range: Size: 0-1" X 0.001	precise measuring instrument used during pressuremeter calibration to measure change in pressuremeter diameter	1/28/2008	1/28/2009	InSitu Eng	InSitu Engineering pressuremeter equipment	Global Calibration Services	ISO 9001:200, ANSI/NCSL Z540-1, ISO/IEC 17025-2005, ISO 10012:2003	NQA ISO 9001 Registered, ANAB Accredited
7.003	CODE 1 7/9/08	27375-01-001	Pressure Test Gauge Model: 100NTMBGY21 Range: Size: 300 x 1 PSI	precise measuring instrument used during pressuremeter calibration to measure change in pressure within pressuremeter membrane	1/28/2008	1/28/2009	InSitu Eng	InSitu Engineering pressuremeter equipment	Global Calibration Services	ISO 9001:200, ANSI/NCSL Z540-1, ISO/IEC 17025-2005, ISO 10012:2003	NQA ISO 9001 Registered, ANAB Accredited
7.004	CODE 1 7/9/08	27375-02-001	Pressure Test Gauge Model: 100NTMBPY21 Range: Size: 3000 x 10 PSI	precise measuring instrument used during pressuremeter calibration to measure change in pressure within pressuremeter membrane	1/28/2008	1/28/2009	InSitu Eng	InSitu Engineering pressuremeter equipment	Global Calibration Services	ISO 9001:200, ANSI/NCSL Z540-1, ISO/IEC 17025-2005, ISO 10012:2003	NQA ISO 9001 Registered, ANAB Accredited
7.006	CODE 1 08/22/08	PMT00006	Pressuremeter	probe devise that is inserted into the borehole for pressurementer testing	7/25/2008	7/25/2009	InSitu Eng	Resubmitted 2/10/2009	InSitu Engineering	Unique piece of equipment - No standard available	Insitu equipment calibrated by Global Calibration Services, who is accredited by ANAB & ISO 9001
7.007	CODE 1 08/22/08	PMT00004	Pressuremeter	probe devise that is inserted into the borehole for pressurementer testing	7/24/2008	7/24/2009	InSitu Eng		InSitu Engineering	Unique piece of equipment - No standard available	Insitu equipment calibrated by Global Calibration Services, who is accredited by ANAB & ISO 9001
7.008	CODE 1 08/22/08	PMT00005	Pressuremeter	probe devise that is inserted into the borehole for pressurementer testing	7/25/2008	7/25/2009	InSitu Eng		InSitu Engineering	Unique piece of equipment - No standard available	Insitu equipment calibrated by Global Calibration Services, who is accredited by ANAB & ISO 9001
Schnabel Engineering LLC											
8.005	CODE 1 7/8/08	PP-1	Pocket Penetrometer	Field measurement device used to estimate compressive strength of cohesive soils.	N/A	N/A	SEI	SEI; Not calibrate-able, invoice on file	N/A	N/A	N/A
8.006	CODE 1 7/8/08	PP-2	Pocket Penetrometer	Field measurement device used to estimate compressive strength of cohesive soils.	N/A	N/A	SEI	SEI; Not calibrate-able, invoice on file	N/A	N/A	N/A
8.007	CODE 1 7/8/08	PP-3	Pocket Penetrometer	Field measurement device used to estimate compressive strength of cohesive soils.	N/A	N/A	SEI	SEI; Not calibrate-able, invoice on file	N/A	N/A	N/A
8.008	CODE 1 7/8/08	PP-4	Pocket Penetrometer	Field measurement device used to estimate compressive strength of cohesive soils.	N/A	N/A	SEI	SEI; Not calibrate-able, invoice on file	N/A	N/A	N/A

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ID No.	Bechtel Approved	Serial Number	Equipment Description	Equipment Use Description	Calibration Date	Calibration Due Date	Equipment Operator	Remarks	Company Performing Calibration	Nationally Recognized Standard followed (NIST, ASTM, ISO, etc.)	Calibration Company Accreditation (e.g. AMRL, NVLAP, A2LA)
8.013	CODE 1 11/12/08	51787	Solinst Water Level Indicator	Measures depth to water in wells to be used during guaging ground water elevation, permeability tests, and ground water sampling.	11/3/2008		SEI		SEI		
8.014	CODE 1 11/12/08	104255	Troll 700 Pressure Transducer	Measures height of water above the transducer within a well. Used for monitoring water levels during aquifer (permeability) tests.	10/31/2008	10/31/2009	SEI	11/25/08 This probes is not working properly and has been sent to the manufacturer for repair. It will not be used for the project.	Applied Technical Services	ATS-517 Rev 4	A2LA Accredited
8.015	CODE 1 11/12/08	104213	Troll 700 Pressure Transducer	Measures height of water above the transducer within a well. Used for monitoring water levels during aquifer (permeability) tests.	10/31/2008	10/31/2009	SEI		Applied Technical Services	ATS-517 Rev 4	A2LA Accredited
8.016	CODE 1 11/12/08	119329	Troll 700 Pressure Transducer	Measures height of water above the transducer within a well. Used for monitoring water levels during aquifer (permeability) tests.	10/31/2008	10/31/2009	SEI		Applied Technical Services	ATS-517 Rev 4	A2LA Accredited
8.017	CODE 1 11/12/08	104259	Troll 700 Pressure Transducer	Measures height of water above the transducer within a well. Used for monitoring water levels during aquifer (permeability) tests.	10/31/2008	10/31/2009	SEI	11/25/08 This probes is not working properly and has been sent to the manufacturer for repair. It will not be used for the project.	Applied Technical Services	ATS-517 Rev 4	A2LA Accredited
8.018	CODE 4 11/19/08	47272	multi-parameter TROLL 9500	Meaures several ground water parameters in-situ during ground water sampling events. i.e. pH, DO, Cond, etc.	10/16/2008	10/16/2009	SEI	Calibration of this instrument is being performed separately by Bechtel at a facility identified on Bechtel's ESL	Quality Control Services	ISO/IEC 17025 and ANSI/Z540-1-1994	A2LA Accredited
GEOVision											
9.002	CODE 1 7/29/08	160024	OYO PS Suspension Telemetry Unit (In-Hole Digital Seismograph)	Seismograph that records timing and voltage signal from geophones in the PS suspension logger probe.	1/25/2008	1/25/2009	GVI	PS logging seismograph	SCE	ISO/IEC 17025:1999	NVLAP
9.007	CODE 1 8/18/08	5368	Robertson Geologging Borehole Caliper and Natrual Gamma Tool	Caliper and natural gamma probe. Measures borehole diameter and natural gamma radiation in a borehole.	7/29/2008		GVI	Standardized in field prior to use. Used Robertson Calibration Plate S/N 201 and PVC Downhole Geophysics Caliper Tool Validation Ring S/N PCV-01	GVI	N/A	N/A
9.008	CODE 1 8/18/08	5490	Robertson Geologging Borehole Electric Logging Tool	Electric logging probe. Measures electrical resistivity and self potential in a borehole.	7/29/2008		GVI	Standardized in field prior to use. Used Robertson Geologging Test Box S/N 3153	GVI	N/A	N/A
9.009	CODE 1 8/18/08	5368	Robertson Geologging Borehole Natural Gamma Tool	Probe measures naturally occurring gamma radiation in a borehole	7/29/2008		GVI	Calibration not necessary	GVI	N/A	N/A
9.010	CODE 1 8/18/08	5174	Robertson Acoustic Televiewer and Deviation Tool	Borehole probe measures deviation of the borehole.			GVI	Standardized in field prior to use, used Brunton Field Transit S/N 5081006119	GVI	N/A	N/A
ConeTec											
10.001	CODE 2 8/19/08	AD184	15cm2 Cone	Cone penetrometer probe measures tip and sidewall resistance as the probe is pushed and pore water pressure.	10/5/2007	10/5/2008	CT		Adara Systems	ASTM D 5778-07	

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10.002	CODE 2 8/19/08	AD214	15cm2 Cone	Cone penetrometer probe measures tip and sidewall resistance as the probe is pushed and pore water pressure.	5/12/2008	5/12/2009	CT		Adara Systems	ASTM D 5778-07	
10.003	CODE 2 8/19/08	AD215	15cm2 Cone	Cone penetrometer probe measures tip and sidewall resistance as the probe is pushed and pore water pressure.	7/9/2008	7/9/2009	CT		Adara Systems	ASTM D 5778-07	
10.004	CODE 2 8/19/08	AD167	15cm2 Cone	Cone penetrometer probe measures tip and sidewall resistance as the probe is pushed and pore water pressure.	7/28/2008	7/28/2009	CT		Adara Systems	ASTM D 5778-07	
Uni-Tech Drilling, Inc.											
11.001	CODE 1 8/27/08	140	Hammer Weight	SPT hammer for CMT style automatic hammer used to drive sampler into the ground.	8/18/2008	8/18/2009	UNI		National Certified Testing Laboratories	ISO/IEC 17025:2005	Equipment calibrated by Rogan, which is accreditated by Laboratory Accredation Bureau
In-Situ Soil Testing (Dilatometer)											
12.001	CODE 1 8/19/08	B075297	Pressure Gage	Measures pressure required to expand dilatometer bladder.	7/13/2008	7/13/2009	IST		Davis Calibration	ANSI/NCSL 7540-1-1994, ISO 10012, 10CFR50 AppxB, and	
12.002	CODE 1 8/19/08	B075298	Pressure Gage	Measures pressure required to expand dilatometer bladder.	7/26/2008	7/26/2009	IST		Davis Calibration	ANSI/NCSL 7540-1-1994, ISO 10012, 10CFR50 AppxB, and 10CFR21	
12.003	CODE 1 8/19/08	Q12672-1	Load Cell	Load cell used for drill rig set-up. The cell measures downward thrust while driving the dilatometer.	7/9/2008		IST		Strainsert		
12.004	CODE 1 11/12/08	191823	Load button load cell, Transducer Techniques Model LBO-10K	For thrust monitoring on track Rig. Four are used on track rig simultaneously to measure the downward thrust required to push the dilatometer.	10/8/2008	10/8/2009	IST	For thrust monitoring on track Rig. Four are used on track rig simultaneously	Transducer Techniques	NIST 75668	
12.005	CODE 1 11/12/08	191825	Load button load cell, Transducer Techniques Model LBO-10K	For thrust monitoring on track Rig. Four are used on track rig simultaneously to measure the downward thrust required to push the dilatometer.	10/8/2008	10/8/2009	IST	For thrust monitoring on track Rig. Four are used on track rig simultaneously	Transducer Techniques	NIST 75668	
12.006	CODE 1 11/12/08	191826	Load button load cell, Transducer Techniques Model LBO-10K	For thrust monitoring on track Rig. Four are used on track rig simultaneously to measure the downward thrust required to push the dilatometer.	10/8/2008	10/8/2009	IST	For thrust monitoring on track Rig. Four are used on track rig simultaneously	Transducer Techniques	NIST 75668	
12.007	CODE 1 11/12/08	191827	Load button load cell, Transducer Techniques Model LBO-10K	For thrust monitoring on track Rig. Four are used on track rig simultaneously to measure the downward thrust required to push the dilatometer.	10/8/2008	10/8/2009	IST	For thrust monitoring on track Rig. Four are used on track rig simultaneously	Transducer Techniques	NIST 75668	
12.008	CODE 2 10/30/08	229473	Load button load cell, Transducer Techniques Model LBO-10K	For thrust monitoring on track Rig. Four are used on track rig simultaneously to measure the downward thrust required to push the dilatometer.	10/8/2008	10/8/2009	IST	For thrust monitoring on track Rig. Four are used on track rig simultaneously	Transducer Techniques	NIST 75668	
12.009	CODE 2 11/12/08	Z70021R	Test Gauge, 0-100 Bar x 0.5 Bar	Measures pressure required to expand dilatometer bladder.	11/5/2008	11/5/2009	IST		Davis Calibration	Procedure T.O. 33K6-4-427-1 NIST Traceable #: 1994055	ISO 9001:2000. "Lab operations meet the requirements of ANSI/NCSL Z540-1-1994, ISO 10012, 10CFR50 Appx B, and 10 CFT21."
12.010	CODE 2 11/24/08	233454	LBO-10K Load Cell	For thrust monitoring on track Rig. Four are used on rig simultaneously to measure the downward thrust required to push the dilatometer.	11/12/2008	11/12/2009	IST		Transducer Techniques	Traceable to NIST Test # 75668	

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12.011	CODE 2 11/24/08	233452	LBO-10K Load Cell	For thrust monitoring on track Rig. Four are used on rig simultaneously to measure the downward thrust required to push the dilatometer.	11/12/2008	11/12/2009	IST		Transducer Techniques	Traceable to NIST Test # 75668	
12.012	CODE 2 11/24/08	233453	LBO-10K Load Cell	For thrust monitoring on track Rig. Four are used on rig simultaneously to measure the downward thrust required to push the dilatometer.	11/12/2008	11/12/2009	IST		Transducer Techniques	Traceable to NIST Test # 75668	
12.013	CODE 2 11/24/08	Z700742	Wika Test Gauge -1 to 10 Bar	Measures pressure required to expand dilatometer bladder.	11/13/2008	11/13/2009	IST		Davis Calibration	Procedure T.O. 33K6-4-427-1 NIST Traceable #: 1994055	ISO 9001:2000. "Lab operations meet the requirements of ANSI/NCSL Z540-1-1994, ISO 10012, 10CFR50 Appx B, and 10 CFR21."
12.014	CODE 2 11/24/08	Z70073Z	Wika Pressure Gauge, 0-60 Bar	Measures pressure required to expand dilatometer bladder.	11/13/2008	11/13/2009	IST		Davis Calibration	Procedure T.O. 33K6-4-427-1 NIST Traceable #: 1994055	ISO 9001:2000. "Lab operations meet the requirements of ANSI/NCSL Z540-1-1994, ISO 10012, 10CFR50 Appx B, and 10 CFR21."

Table A.2
As-Built Subsurface Exploration Point Locations

Table A.2
As-Built Subsurface Exploration Point Locations
Constellation Generation Group (CGG) COL Project - Phase 2
Calvert Cliffs Nuclear Power Plant
Calvert County, Maryland

Location	Depth (ft)	Termination Elevation (ft)	Coordinates (ft) Maryland State Plane (NAD 1927)		Ground Surface Elevation (ft) (NGVD 29)	Elevation (ft) Top of Concrete at Base of Well Head Protector	Elevation (ft) Ground Water Level Measuring Point (Top of Casing at V-Notch)	Date of Survey
			North	East				
B-301A	350.0	-253.3	217011.10	960816.80	96.70	N/A	N/A	11/21/2008
B-301B	120.0	-23.2	217002.60	960819.20	96.80	N/A	N/A	11/21/2008
B-342	250.0	-174.3	217217.60	960272.90	75.70	N/A	N/A	11/21/2008
B-343	250.0	-166.9	217037.80	960306.80	83.10	N/A	N/A	11/21/2008
B-344	250.0	-177.7	216976.80	960358.00	72.30	N/A	N/A	5/14/2008
B-345	250.0	-180.4	217097.30	960392.90	69.60	N/A	N/A	11/21/2008
B-346	100.0	-38.2	217206.40	960400.40	61.80	N/A	N/A	5/14/2008
B-347	200.0	-139.8	217214.20	960531.80	60.20	N/A	N/A	5/14/2008
B-348	200.0	-131.6	217148.90	960567.40	68.40	N/A	N/A	11/21/2008
B-349	100.0	-45.6	217396.40	960537.50	54.40	N/A	N/A	5/15/2008
B-350	100.0	-53.4	217516.20	960789.00	46.60	N/A	N/A	5/14/2008
B-351	100.0	-29.9	217072.10	960538.30	70.10	N/A	N/A	11/21/2008
B-352	200.0	-90.7	216829.40	960893.90	109.30	N/A	N/A	11/21/2008
B-353	200.0	-89.1	216772.70	960972.20	110.91	N/A	N/A	5/13/2008
B-354	251.5	-159.1	217131.10	961098.90	92.40	N/A	N/A	11/20/2008
B-355	250.0	-161.8	217052.60	960993.50	88.20	N/A	N/A	5/13/2008
B-356	250.0	-129.0	216965.30	961264.90	121.00	N/A	N/A	11/20/2008
B-357	105.0	-1.9	216923.10	961175.40	103.10	N/A	N/A	11/20/2008
B-357A	250.0	-147.0	216928.80	961167.00	103.00	N/A	N/A	11/20/2008
B-771	100.0	-89.4	219268.20	960931.90	10.60	N/A	N/A	7/1/2008
B-772	100.0	-89.4	219323.90	960876.10	10.60	N/A	N/A	7/1/2008
B-773 (DH)	165.0	-157.1	219241.30	961045.90	7.90	N/A	N/A	7/1/2008
B-773A	150.0	-141.7	219233.10	961052.90	8.30	N/A	N/A	11/25/2008
B-773B	150.0	-142.0	219248.10	961039.90	8.00	N/A	N/A	11/25/2008
B-774	150.0	-139.9	219196.00	961000.50	10.10	N/A	N/A	7/1/2008
B-775	100.0	-90.3	219105.30	961091.50	9.70	N/A	N/A	7/1/2008
B-776	51.5	-41.9	219143.00	961053.70	9.60	N/A	N/A	7/14/2008
B-778	121.5	-7.9	219075.00	960739.60	113.60	N/A	N/A	11/25/2008
B-779	102.0	-1.2	218941.10	960604.80	100.80	N/A	N/A	7/2/2008
B-780	6.0	3.7	219546.20	960610.00	9.70	N/A	N/A	11/25/2008
B-780A	8.0	1.2	219542.40	960604.10	9.20	N/A	N/A	11/25/2008
B-780B	50.0	-40.8	219532.90	960625.20	9.20	N/A	N/A	11/25/2008
B-781	50.0	-39.6	219400.90	960780.80	10.40	N/A	N/A	7/14/2008
B-782	51.5	-41.6	218936.50	961232.10	9.90	N/A	N/A	7/1/2008
B-785	70.0	28.1	218155.90	960637.40	98.10	N/A	N/A	11/25/2008
B-786	11.5	50.5	217943.50	960500.50	62.00	N/A	N/A	11/25/2008
B-786A	80.0	-17.9	217943.20	960496.40	62.10	N/A	N/A	11/25/2008
B-786B (DH)	115.0	-60.8	217914.60	960460.70	54.20	N/A	N/A	11/25/2008
B-787	100.0	-50.6	217780.90	960598.10	49.40	N/A	N/A	11/25/2008

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Calvert County, Maryland

Location	Depth (ft)	Termination Elevation (ft)	Coordinates (ft) Maryland State Plane (NAD 1927)		Ground Surface Elevation (ft) (NGVD 29)	Elevation (ft) Top of Concrete at Base of Well Head Protector	Elevation (ft) Ground Water Level Measuring Point (Top of Casing at V-Notch)	Date of Survey
			North	East				
B-788	50.0	2.1	217495.90	960896.10	52.10	N/A	N/A	11/21/2008
B-789	100.0	-42.7	217401.70	960986.90	57.30	N/A	N/A	11/21/2008
B-790	49.7	23.0	217278.10	961110.50	72.72	N/A	N/A	5/13/2008
B-791	100.0	-12.5	217143.50	961245.10	87.47	N/A	N/A	5/13/2008
B-821	50.0	-41.1	218736.30	961124.60	8.90	N/A	N/A	7/1/2008
B-821A (DH)	115.0	-89.6	218571.30	960962.80	25.40	N/A	N/A	11/25/2008
B-821B	7.6	-1.3	218727.20	961275.20	6.30	N/A	N/A	11/25/2008
B-821C	30.0	-22.6	218739.50	961258.10	7.40	N/A	N/A	11/25/2008
B-822	50.0	-11.2	218440.20	960840.80	38.80	N/A	N/A	7/2/2008
C-724	13.2	-5.3	219309.80	960973.50	7.90	N/A	N/A	7/1/2008
C-724A	152.3	-144.4	219309.30	960973.90	7.90	N/A	N/A	11/25/2008
C-725	152.4	-144.2	219157.70	961143.90	8.20	N/A	N/A	7/1/2008
C-726	52.5	-43.3	219479.90	960691.80	9.20	N/A	N/A	11/25/2008
C-727	101.4	-93.2	219368.30	960914.90	8.20	N/A	N/A	7/1/2008
C-728	52.8	-42.8	218975.50	961193.00	10.00	N/A	N/A	7/1/2008
C-747	52.8	-43.7	218860.20	961248.50	9.10	N/A	N/A	7/1/2008
C-748	41.3	-8.9	218521.40	960909.80	32.40	N/A	N/A	11/25/2008
C-748A	52.2	-19.9	218518.90	960908.70	32.30	N/A	N/A	11/25/2008
C-749	18.4	43.9	218344.50	960737.80	62.30	N/A	N/A	11/25/2008
C-749A	42.0	20.3	218346.40	960740.00	62.30	N/A	N/A	11/25/2008
DMT-301	350.0	-253.1	216992.50	960824.60	96.90	N/A	N/A	11/21/2008
DMT-701	149.6	-141.7	219181.00	961120.50	7.90	N/A	N/A	7/1/2008
PM-301	361.0	-258.0	216995.50	960794.00	103.00	N/A	N/A	11/20/2008
PM-701	151.0	-142.5	219185.50	961096.10	8.50	N/A	N/A	7/1/2008
OW-304	72.8	-4.0	217158.10	960920.80	68.8	69.28	71.01	11/21/2008
OW-308	103.0	8.5	216928.00	960750.00	111.5	111.95	113.62	11/21/2008
OW-774A	23.0	-13.3	219187.30	961030.50	9.7	10.20	12.20	11/25/2008
OW-774B	52.8	-42.7	219176.70	961020.20	10.1	10.50	12.55	11/25/2008
OW-778	52.0	61.3	219100.60	960728.60	113.3	113.70	115.45	11/25/2008
OW-779	52.5	48.4	218958.70	960587.30	100.9	101.30	102.94	11/25/2008
OW-781	53.0	-42.7	219421.30	960764.40	10.3	10.80	12.87	11/25/2008

Note: As-built survey coordinates and elevations were provided by Collinson Oliff and Associates, Inc.

Table A.3
Subcontractors

Table A.3
Subcontractors
Constellation Generation Group (CGG) COL Project - Phase 2
Calvert Cliffs Nuclear Power Plant
Calvert County, Maryland

Subcontractor Name	Contact Information	Services Provided
ABM Construction Co., Inc.	Ms. Mari Muirhead P.O. Box 402 Lusby, MD 20657	Clearing and grading services.
A. Morton Thomas and Associates, Inc.	Mr. Kenneth Williams 12750 Twinbrook Parkway, Suite 200 Rockville, MD 20852	Underground utility locating services.
Collinson, Oliff and Associates, Inc.	Mr. Richard Lewis P.O. Box 2209 (288 Merrimac Ct.) Prince Frederick, MD 20678	Surveying services.
ConeTec, Inc.	Mr. Ethan Cargill 606 Roxbury Industrial Center Unit P Charles City, VA 23030	CPT services.
Connelly and Associates, Inc.	Mr. Sam Connelly 260 Interstate Court Frederick, MD 21704	Drilling services.
GeoVision	Mr. John Diehl 1124 Olympic Dr. Corona, CA 92881	Borehole geophysical logging and suspension P-S velocity logging services.
GRL Engineers, Inc.	Mr. Scott Webster 9912 Colvard Circle Charlotte, NC 28269	SPT hammer energy testing services.
Insight, LLC	Mr. Denny Showalter 4280-F Henninger Ct. Chantilly, Virginia 20151	Underground utility locating services.
In Situ Engineering	Mr. Keith Brown 6232 195th Avenue SE Snohomish, WA 98290	Pressuremeter testing services.
In-Situ Soil Testing, L.C.	Mr. Roger A. Failmezger 1626 Corrotoman Drive Lancaster, Virginia 22503	Drilling and DMT services.
UniTech Drilling Co.	Ms. Joan Baer 61 Grays Ferry Road PO Box 407 Franklinville, NJ 08322	Drilling services.

APPENDIX B

UNDERGROUND UTILITY DETECTION

Daily Summaries for Underground Utility Location

DAILY SUMMARIES FOR UNDERGROUND UTILITY LOCATION (7 Pages)

SCHNABEL ENGINEERING

BY ..... DATE .....
CHKD. BY ..... DATE 6/16/08
SUBJECT.....

SHEET NO. ..... OF .....
JOB NO. .....

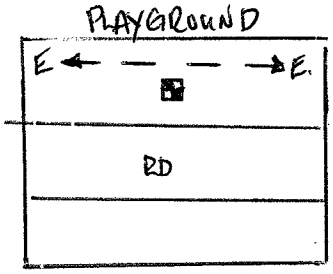
UTILITY LOCATE

Priority I

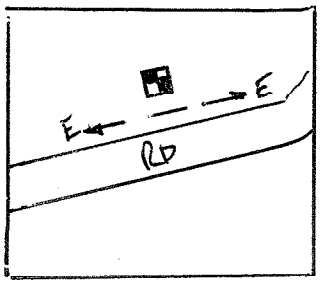
B 358 - Clear
B 350 - Clear
B 788 - Clear
B 789 - Clear
B 790 - TELEPHONE
B 791 - Clear
B 354 - Clear
B 356 - Clear
B 357 - Clear
B 355 - ELECTRIC ?
OW 304 - Disregard
PM 301 - Clear
DMT 301 - Clear
B 352 - ELECTRIC ?
B 353 - Clear
B 359 - Clear
B 360 - Clear
B 344 - Clear
B 343 - Clear
B 342 - Clear
B 345 - Clear
B 346 - Clear
B 351 - Clear
B 348 - Clear
B 347 - Clear
B 349 - Clear

Priority II

B 792 - Clear
B 793 - Clear
B 794 - Clear
B 795 - Clear
B 796 Clear
DMT 702 Clear
PM 702 Clear
C 732 Clear



SKETCH B-355



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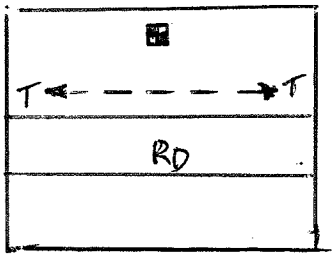


SKETCH B-790

NOTE: CAN NOT CONFIRM EXACT TYPE OF UTILITY LOCATED.

Kenneth Wells
AMT 6-16-08

Daily Summary for Underground Utility Location
CCNPP Subsurface Investigation

Date: 7-15-08

Equipment Serial I.D. No.: 017589

Weather Conditions: Sunny, Warm

Crew Foreman: J. Buckler

Additional Crew Member(s): Nelson Aguilar

Arrival Time: 915am

Departure Time: 4:15 pm

Test Point No.	Utility Found (Yes/No)	Safety Designation (COL/DDE)	Comments (Utility Description, etc.)
O.W. 308	NO	COL	
O.W. 304	NO	COL	
B-821	NO	COL	
C-747	NO	COL	
B-782	NO	COL	
C-720	NO	COL	
C-725	NO	COL	
PMT-701	NO	COL	
PM-701	YES	COL	Approx 40" Deep Electric Duct Bank + 13KV pwr Line
B-773	Yes	COL	Electric Duct + 13KV pwr. Line Approx 40" Deep
C-724	Yes	COL	Elec Duct Bank + 13KV Line Approx 40" Deep
C-727	NO	COL	
B-781	NO	COL	
OW-781	Yes	COL	13KV Line Approx 40" Deep
C-726	Yes	COL	Elec Duct Bank/13 KV Line Approx 40" Deep
B-780	NO	COL	
B-772	NO	COL	
B-771	NO	COL	
B-774	NO	COL	
OW 774-A	NO	COL	
OW 774-B	NO	COL	
B-776	NO	COL	
B-775	NO	COL	
B-779	NO	COL	
OW 779	NO	COL	
OW 778	NO	COL	

Daily Summary for Underground Utility Location
CCNPP Subsurface Investigation

Date: 7-15-08

Equipment Serial I.D. No.: 017589

Weather Conditions: Sunny warm

Crew Foreman: Jim Buckle

Additional Crew Member(s): Nelson Aguilar

Arrival Time: 915 am

Departure Time: 415 pm

Test Point No.	Utility Found (Yes/No)	Safety Designation (COL/DDE)	Comments (Utility Description, etc.)
B-778	NO	COL	
B-786	NO	COL	
B-785	NO	COL	
C-749	NO	COL	
B-804	NO	~~COL~~ DDE	KAM 7/15/08
B-822	NO	~~COL~~	
C-748	NO	COL	
B-804 MVD	NO	~~COL~~ DDE	KAM 7/15/08 Approved offset 50' @ AZ260 Swept moved location
B-805	NO	~~COL~~ DDE	
B-806	NO	DDE	
B-808	NO	DDE	
PM 702 (MVD)	NO	DDE	Approved offset of 28' plant North Swept moved location
B-807	YES	DDE	13KV Approx 50' Deep
B-787	NO	COL	

Daily Summary for Underground Utility Location
CCNPP Subsurface Investigation

Date: 7-16-08

Page: 1 of 1

Equipment Serial I.D. No.: 017589

Weather Conditions: Sunny, Warm

Crew Foreman: J. Buckler

Additional Crew Member(s): Nelson Aguilar

Arrival Time: 930 A

Departure Time:

Test Point No.	Utiliy Found (Yes/No)	Safety Designation (COL/DDE)	Comments (Utility Description, etc.)
DW-304 (MUD)	NO		Swept moved Location
B-816	NO		
B-819	NO		
B-820	NO		
B-799	NO		
B-798 (MUD)	NO		Swept moved Location
C-733	NO		
B-797	NO		
C-734 (MUD)	NO		Swept Moved Location
DMT-703 (MUD	NO		Swept Moved Location
B-803 (MUD	NO		Swept Moved Location
C-735	NO		
B-800 (MUD	NO		Swept Moved Location
PM-703	NO		
~~PM-703 (MUD)~~	NO		~~Swept Moved Location~~ AEM 7/16/08
C-737 (MUD)	NO		Swept Moved Location
C-736	NO		
B-801 (MUD)	NO		Swept Moved Location
B-802	NO		
B-780 (MUD)	NO		Approved offset 20' Plant south Swept moved Location
PM 701 (MUD)	YES		13KV Line. Approx 60" Deep Approved offset of 15' plant west Swept moved Location
C-749 (MUD)	NO		Approved offset of 30' Plant East. Swept moved Location

Daily Summary for Underground Utility Location
CCNPP Subsurface Investigation

Date: 7/31/08

Page: 1 of 1

Equipment Serial I.D. No.: 017589

Weather Conditions: Cloudy

Crew Foreman: Buckler

Additional Crew Member(s):

Arrival Time: 900AM

Departure Time: 1130A

Test Point No.	Utility Found (Yes/No)	Safety Designation (COL/DDE)	Comments (Utility Description, etc.)
PM-301(MVD)	NO	Col	Unapproved offset of 49' on AZ230
[redacted]	[redacted]		Approval of FCR pending.
B 780-B	NO	COL	Approved offset of 40' plant South
PM-703(MVD)	NO	DDE	Approved offset Location

Schnabel Engineering, LLC (06120048)

Daily Summary for Underground Utility Location
CCNPP Subsurface Investigation

Date: Aug 29, 08

Page: 1 of 1

Equipment Serial I.D. No.: 017589 KEM 8/29/08

Weather Conditions: RAINY

Crew Foreman: Buckler

Additional Crew Member(s): NONE

Arrival Time: 1000 AM

Departure Time: 1100 AM

Test Point No.	Utility Found (Yes/No)	Safety Designation (COL/DDE)	Comments (Utility Description, etc.)
DMT-301	NO	COL	Approved offset of 10' on AZ 165 (CY00-F-021)
PM-301	NO	COL	Approved offset 47' on AZ 206 (CY00-F-021)

Schnabel Engineering, LLC (06120048)

Daily Summary for Underground Utility Location
CCNPP Subsurface Investigation

Date: 10/20/08

Page: 1 of 1

Equipment Serial I.D. No.: 24054

Weather Conditions: Sunny 60°

Crew Foreman: Bucklar

Additional Crew Member(s): —

Arrival Time: 1230 pm

Departure Time: 2:15 pm

Test Point No.	Utility Found (Yes/No)	Safety Designation (COL/DDE)	Comments (Utility Description, etc.)
B-786B	NO	COL	Additional FIDS Bore Hole
B-821 A	NO	Col	Additional FIDS Bore Hole
B-746	NO	Col	possible Additional Intake area Boring

Schnabel Engineering, LLC (06120048)

APPENDIX C

SPT BORINGS

Test Boring General Notes
Field Description Sheets
SPT Boring Logs
Photos of SPT Samples

TEST BORING GENERAL NOTES
(2 Pages)

Test Boring General Notes

1. Test borings were logged by Schnabel personnel to provide a record for geotechnical evaluation or other specialized purposes. The log itself includes a description of soil materials encountered using visual classification in the field. The group symbols on the logs represent the Unified Soil Classification System Group Symbols (ASTM D-2488) based on visual observation and limited laboratory testing of the samples. Criteria for visual identification of soil samples are included in project Technical Procedure T02, Classification and Logging of Samples. Some variation may be expected between samples visually classified and samples classified in the laboratory. Boundary lines between various material units are identified where possible. Any significant features such as fill conditions, underground structures, groundwater, or water seepage conditions are recorded when observed.

2. Numbers in the sampling data column of test boring logs represent the sample number and sample type; standard penetration test (SPT) blow counts, and recovery length and percentage for each SPT sample; and the recovery length and percentage for each undisturbed sample. The blow counts indicate the number of SPT hammer blows required to drive the SPT sampler three successive 6-inch intervals. The first 6-inch interval typically represents a seating interval. The total of the number of blows for the second and third intervals is the N value, unless the standard penetration testing for a given interval was stopped when blow counts reached 50 blows in any 6-inch interval (i.e., stopped at "refusal"). In cases where refusal is reached, the N value is defined as the total number of blows performed in the last two intervals (or the total number of blows performed in the first interval if refusal was achieved in the first interval) over the penetration length resulting from those blows (e.g., 60/8").

3. Material descriptions are based on visual observation and are in accordance with the Unified Soil Classification System. Representative soil samples are recovered from the boring logs for later identification and testing.

4. The values following "PP=" in the Tests column of the logs represent pocket penetrometer readings. Pocket penetrometer readings provide an estimate of the unconfined compressive strength of fine-grained soils.

5. Key to abbreviations and symbols:

PL = Plastic Limit
MC = Moisture Content
LL = Liquid Limit
WOH = Weight of Hammer

☒ = Interval Sampled by SPT
■ = UD Tube Sample Pushed

6. The boring logs and related information depict subsurface conditions at these specific locations and at the particular time when drilled. Soil conditions at other locations may differ from conditions occurring at these boring locations. The passage of

time may result in a change in the subsurface soil and groundwater conditions at these boring locations.

7. The stratification lines represent the approximate boundary between soils and/or rock types as observed in the drilling and sampling operation. Some variation may be expected vertically between samples taken. The soil profile, water level observations and penetration resistances presented on the boring logs have been made with reasonable care and accuracy, and must be considered only an approximate representation of subsurface conditions to be encountered at the particular location.

8. Estimated groundwater levels are indicated on the logs. These are only estimates from available data and may vary with precipitation, porosity of the soil, site topography and similar factors.

FIELD DESCRIPTION SHEETS
(2 Pages)

Guide to Soil Classification and Organization for 2008 CCNPP Subsurface Investigation

1) Depostional Environment

Soil Type	Record on log as
FILL	*FILL, sampled as*
PROBABLE FILL	*PROBABLE FILL, sampled as*

*the group name that follows will be all lower case
(for example, *FILL, sampled as silty sand with gravel,...*)

2) Group Name (as per ASTM 2488)

Gradation
POORLY GRADED
WELL GRADED

Secondary Major	Primary Major	Teritiary Major*
SANDY	*SAND*	*WITH SAND*
GRAVELLY	*GRAVEL*	*WITH GRAVEL*
SILTY	*SILT*	*WITH SILT*
CLAYEY	*ELASTIC SILT*	*WITH CLAY*
	LEAN CLAY	*see ASTM for additional options
	FAT CLAY	
	ORGANIC SOIL	

3) Group Symbol - enclose with parantheses (__)

Inorganic fine-grained		Coarse-grained	
Clays	Silts	Sands	Gravels
CL	***ML***	***SW***	***GW***
CH	***MH***	***SP***	***GP***
Organic fine-grained		***SW-SM***	***GW-GM***
OL/OH		***SW-SC***	***GW-GC***
		SP-SM	***GP-GM***
		SP-SC	***GP-GC***
		SM	***GM***
		SC	***GC***

4) Grain size

sand particles	Record on log as:
fine grained sand	*f. sand*
medium grained sand	*med. sand*
coarse grained sand	*c. sand*
gravel particles	**Record on log as**
fine gravel	*f. gravel*
coarse gravel	*c. gravel*

► may record range, *f. to med. sand, f. to c. sand,* or *f. to c. gravel*
► record for coarse-grained, or sandy fine-grained soils

5) Angularity

Description	Criteria
angular	Particles have sharp edges and relatively plane sides with unpolished surfaces
subangular	Particles are similar to angular description but have rounded edges
subrounded	Particles have nearly plane sides but have well-rounded corners and edges
rounded	Particles have smoothly curved sides and no edges

► may record range for particle type observed, *angular to subrounded c. sand* or *subangular to subrounded gravel*
► use closed paratheses for additional observed particle types, for example: *…,subangular to angular c. sand (rounded gravel),…*
► record for coarse sand, gravel, cobble and boulder-sized particles

6) Moisture

Description	Criteria
dry	dusty, dry to touch
moist	damp but no visible water
wet	visible free water, usually soil below water table

► select one that is most appropriate
► if sections of a soil sample consisting of the same material and description differ only by moisture condition, then record observation in following format:
Changes to wet at __ ft

7) Color

Shade:	light, dark	Record on log as: *lt., dk.*
Secondary Colors:	*blackish, bluish, brownish, grayish, olive, greenish, orangish, pinkish, purplish, reddish, whitish, yellowish*	
Primary Colors:	*black, blue, brown, gray, green, olive, orange, pink, purple, red, white, yellow*	
Conjunction:	*and, to, with, with mottles of, with speckles of, with streaks of, with bands of*	

► At a minimum, a color consists of a primary color; shade and secondary color are color modifiers used as needed.
► if more than two soil colors observed or soil color pattern is more complex than listed conjunctions, record additional comments in paratheses, for example:
…,lt. green with bands of yellowish brown (shells weathered dk. yellowish red),...

8) Minor Components

Percentage estimates*	Soil components	Additional components*	
contains	*gravel*	*asphalt*	*metal*
est. <5%	*sand*	*brick fragments*	*mica*
est. 5-10%	*silt*	*burnt wood*	*organics*
est. 15-25%	*clay*	*cemented sands*	*rock fragments*
est. 30-45%	examples:	*concrete*	*roots*
est. 50-100%	*est. <5% f. gravel*	*coquina*	*shells*
	est. 5-10% f. to c. sand	*crushed stone*	*wood*
*use "percentage estimates" when appropriate; "contains" indicates presence of	*est. <5% silt*	*glass*	
		*list is not exhaustive	

► if more than 3 minor component descriptors are needed, enclose additional minor components in parantheses

Layer and **Interbeds** description*:
Record description as a comment enclosed in parantheses:

Layer description format: *(contains __ inch layer of group name (group symbol), moisture, color at __ ft)*

Example: …,(contains 0.5 inch layer of fat clay with sand (CH), moist, dk. brown, est. 15-25% organics at 34.3 ft),…

Interbeds description format: *__ to __ ft: Interbeds of [soil description] and [soil description]*

Example: *18.5 to 19.0 ft: Interbeds of SILTY SAND (SM), f. to med. sand, wet, yellowish brown and orangish brown, and SILT (ML), moist, grayish brown, est. <5% sand, contains mica*

Example:

88.5 to 90 ft: Interbeds of POORLY GRADED SAND WITH SILT (SP-SM), f. to c. sand, angular c. sand, wet, light gray, est. 50-100% shells, strong HCl, stratified (2 to 4 inches), strong cementation, (c. sand crumble), (sand particles are shell fragments), and SILTY SAND, (SM), f. to c. sand, rounded c. sand, wet, dark gray, est. 15-25% shells, strong HCl reactions (with shells), weak HCl (with soil), stratified (3 to 6 inches), (c. sand hard), (c. sand appears to be quartz)

* **Layer**: singular, discrete, non- dominant soil type(s) within a dominant soil type; record thickness, less dominant soil type, depth

* **Interbeds**: multiple, discrete, alternating dominant soil types; record depth interval, both dominant soil types, structure

ADDITIONAL DESCRIPTORS

9) Odor

Descritption	Criteria
organic odor	decaying vegetation
petroleum odor	petroleum odor
chemical odor	chemical odor
other	explain

► enclose comments on odor in closed paranetheses
for example, …,*chemical odor (possibly creosote)*,...

10) HCl reaction

Description	Criteria
no HCl	No visible reaction
weak HCl	Some reaction
strong HCl	Violent reaction

► In paratheses, reccrd additional HCl reaction comments as needed, such as HCl reacts with shells only, soil only, soil and shells or shels present but no HCL

Example …, *strong HCL (with shells), weak HCl (with soil)*,…
or *no HCl (with shells or soil)*

11) Consistency of fine-grained soils

Description	Criteria
v. soft	thumb will penetrate soil more than 1 in. (25 mm)
soft	thumb will penetrate soil about 1 in. (25 mm)
firm	thumb will indent soil about 1/4 in. (6 mm)
hard	thumb will not indent soil but readily indented with thumbnail
v. hard	thumbnail will not indent soil

► not appropriate with soils with significant amount of gravel

12) Structure

Description	Criteria
stratified	alternating layers of varying material or color with layers at least 6mm thick; note thickness
laminated	alternating layers of varying material or color with the layers less than 6 mm thick; note thickness
fissured	breaks along definite planes of fracture with little resistance to fracturing
slickensided	fracture planes appear polished or glossy, sometimes striated
blocky	cohesive soil that can be broken down into small angular lumps which resist further breakdown
lensed	inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay; note thickness
homogeneous	same color and appearance throughout

Example: …,*stratified (3 to 6 inch layers of poorly graded sand with silt)*,...

13) Cementation

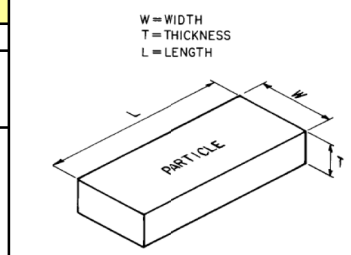
Description	Criteria
weak cementation	Crumbles or breaks with handling or little finger pressure
moderate cementation	Crumbles or breaks with considerable finger pressure
strong cementation	Will not crumble or break with finger pressure

► *appropriate for coarse-grained soils*

14) Shape

Description	Criteria
flat	width / thickness > 3
elongated	length / width > 3
flat and elongated	meets both criteria

► indicate fraction of particles that have the shape in paratheses
for example, …,*(30% of gravel particles are flat)*,...
► record for gravel, cobbles, or boulders



15) Hardness

Descrition	Criteria
hard	particle did not crack, fracture, or crumble under hammer blow
fracture	particle fractured under hammer blow
crumble	particle crumbled under hammer blow

► indicate particle size tested and hardness in parantheses. Examples: …, *(c. sand hard)*,…
or …, *(gravel crumble)*,…)
► record for coarse sand, gravel, cobble, or boulder-sized particles

16) Comments

Record any specific geologic observations that are determined to be of importance but not listed above. Enclose comments in parantheses. Examples,
…,*(trace fossils, possibly skolithos, observed in c. gravel)*,... or …,*(50% of shells are turritella)*,... or
…,*(20% of shells have a distincitive color pattern: pink with dark black spots)*

Example soil sample descriptions:

SILTY SAND WITH GRAVEL, (SM), f. to c. sand, rounded c. sand (subangular to subrounded gravel), wet, yellowish red with bands of lt. brcwn (shells stained yellowish red), est. 5-10% shells, strong HCl (with shells), no HCL (with soil), stratified (2 to 4 inch alternating color layers), (c. sand crumble), (gravel hard), (trace fossils, possibly skilothos, observed in c. gravel)

PROBABLE FILL, sampled as poorly graded sand with silt, f. to med. sand, moist, brown with mottles of dk. brown, est <5% f. grav., est. <5% concrete, est. <5% brick fragments, (est <5% metal), petroleum odor (possibly gasoline)

FAT CLAY, (CH), moist, bluish gray and gray, ccntains roots, contains mica, firm, blocky

88.5 to 90 ft: Interbeds of POORLY GRADED SAND WITH SILT (SP-SM), f. to c. sand, angular c. sand, wet, light gray, est. 50-100% shells, strong HCl, stratified (2 to 4 inches), strong cementation, (c. sand crumble), (sand particles are shell fragments), and SILTY SAND, (SM), f. to c. sand, rounded c. sand, wet, dark gray, est. 15-25% shells, strong HCl reactions (with shells), weak HCl (with soil), stratified (3 to 6 inches), (c. sand hard), (c. sand appears to be quartz)

ORGANIC SOIL WITH SAND, (OL/OH), moist, dk. brown, (contains 8 inch layer of silty sand, wet, light brown, est. 15-25% organics), organic odor, other (cypress odor), v. soit, laminated (1/8 inch silty sand layers every 3 inches)

CLAYEY SAND, (SC), f. to c. sand, subrounded to rounded c. sand, moist, yellowish brown with speckles of lt. red, est. 30-45% cemented sands, moderate cementation, (c. sand hard)

GRAVELLY SILT WITH SAND, (ML), f. gravel, rounded f. gravel, moist, grayish brown, homogeneous, (50% of gravel particles are elongated), (gravel fracture)

Abbreviations: f. = fine v. = very lt. = light sig. = significant c. = coarse est. = estimated dk. = dark

SPT BORING LOGS
(301 Pages)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-301A** Contract Number: 06120048 Sheet: 1 of 11

Contractor: Uni-Tech Drilling
Malaga, New Jersey

Contractor Foreman: J. Evans

Schnabel Representative: W. Bradfield

Equipment: Failing 1500; N3 Rods

Method: 6" O.D. Drag Bit (Mud Rotary)

Hammer Type: Auto Hammer (140 lb)

Dates Started: 8/18/08 **Finished:** 8/25/08

North: 217011.1 ft **East:** 960816.8 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 96.7 (ft) **Total Depth:** 350.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Start of Day	8/19	7:09 AM	11.7'	---	---
Start of Day	8/20	6:56 AM	25.0'	---	---
Start of Day	8/21	6:53 AM	34.0'	---	---
Completion	8/22	7:30 AM	40.0'	---	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	0.0 - 2.0 ft: SILTY SAND, fine to medium grained sand	SM						0.0 ft: Materials descriptions and USCS symbols are based on observations of cuttings contained in drilling fluid and limited UD samples where available. 0.0 ft: These descriptions, symbols and boundaries provide a general indication of material changes with depth, but do not represent detailed conditions. Refer to B-301 of the 2006 investigation for more detailed material descriptions in this area. 0.0 ft: advanced 6" OD drag bit (mud rotary) to 350.0 ft. 0.0 ft: uniform drilling resistance, smooth drilling, light brown drilling fluid, fine to medium grained sand in cuttings. 2.0 ft: light reddish brown cuttings, fine to coarse silty sand and fine rounded gravel in cuttings
2.0	2.0 - 25.0 ft: SILTY SAND, fine to medium grained sand; estimated 5 - 10% gravel, fine to rounded gravel	SM	94.7		5 10 15 20			

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-301A** Contract Number: 06120048 Sheet: 2 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
25.0	25.0 - 28.0 ft: CLAYEY SAND, fine to medium grained sand	SC	71.7					25.0 ft: light brownish gray drilling fluid, fine to medium grained clayey sand/sandy clay clumps in cuttings
28.0	28.0 - 40.0 ft: SANDY LEAN CLAY, fine to medium grained sand	CL	68.7		30 35			28.0 ft: light grayish brown drilling fluid, fine to medium grained sandy lean clay in cuttings
40.0	40.0 - 55.0 ft: SANDY LEAN CLAY, fine to medium grained sand	CL	56.7		40 45 50			40.0 ft: light yellowish gray drilling fluid, fine to medium sandy lean clay clumps in cuttings
55.0	55.0 - 58.0 ft: CLAYEY SAND, fine to medium grained sand	SC	41.7		55			55.0 ft: harder drilling with slight rig chatter, fine to medium clayey sand and sandy lean clay and coarse sand sized shell fragments in
58.0	58.0 - 60.0 ft: POORLY GRADED SAND,	SP	38.7			UD-1, UNDIST	PP = 1.00 tsf	

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-301A** Contract Number: 06120048 Sheet: 3 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	fine to medium grained sand; wet, gray, estimated <5% silt, no HCl reaction, homogenous structure	SP				REC=9", 38%	PP = 0.75 tsf PP = 0.75 tsf	cuttings 58.0 - 60.0 ft: pitcher samlpe *(continued)* 58.0 - 60.0 ft: uniform drilling resistance, smooth drilling, light gray drilling fluid *(continued)*
60.0	60.0 - 65.0 ft: SILTY SAND, fine to coarse grained sand; wet, gray with speckles of light brownish white, estimated 15 - 25% shell fragments, medium to coarse sand size light brownish white fresh to moderately weathered shell fragments, strong HCl reaction (with shell), no HCl reaction (with soil)	SM	36.7		60	UD-2, UNDIST REC=23", 96%	MC = 21.5% PP = 0.50 tsf LL = NP PP = 0.50 tsf PP = 0.50 tsf	60.0 - 62.0 ft: pitcher sample 60.0 - 68.0 ft: light yellowish gray drilling fluid, fine to medium sand, medium to fine gravel sized shell fragments and weak cemented sands in cuttings
65.0	65.0 - 81.0 ft: SILTY SAND, fine to medium grained sand; moist, light gray, estimated 50 - 100% shell fragments, medium sand to fine gravel size white and light brownish white fresh to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	31.7		65	UD-3, UNDIST REC=22", 92%	PP = 1.00 tsf PP = 0.50 tsf PP = 0.75 tsf	68.0 - 70.0 ft: pitcher sample
					70			70.5 ft: very hard drilling with rig chatter (possible cemented sand), light brownish gray drilling fluid, medium sand to fine gravel sized shell fragments, some cemented sands (hard) and clumps of fine medium silty sands in cuttings
					75			76.0 - 77.0 ft: slightly easier drilling, less rig chatter
					80			77.0 ft: harder drilling with rig chatter, brownish gray drilling fluid, coarse sand size shell fragments and fine to medium silty sand clumps in cuttings
81.0	81.0 - 85.0 ft: POORLY GRADED SAND, medium to coarse grained sand	SP	15.7					78.0 ft: hard drilling with significant rig chatter, light brownish gray drilling fluid
85.0	85.0 - 109.0 ft: CLAYEY SAND, fine to medium grained sand	SC	11.7		85			81.0 ft: medium to coarse sand sized shell fragments and fine to medium sand in cuttings 85.0 ft: easier drilling, uniform drilling resistance, gray drilling fluid, fine to medium silty/clayey sand with coarse sand to coarse gravel
					90			

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-301A** Contract Number: 06120048 Sheet: 4 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
								sized shell fragments in cuttings
					95			
					100			
		SC						
					105			105.0 ft: hard drilling with rig chatter (possible cemented sands/shells), gray drilling fluid
109.0	109.0 - 120.0 ft: SILTY SAND, fine to medium grained sand		-12.3					109.0 ft: easier drilling, uniform drilling resistance, gray drilling fluid, cuttings predominantly medium to coarse sand size shell fragments and clumps of fine to medium silty sand in cuttings
					110			
		SM						
					115			
120.0	120.0 - 160.0 ft: CLAYEY SAND, fine to medium grained sand		-23.3		120			120.0 - 140.0 ft: smooth drilling, uniform drilling resistance, gray drilling fluid, fine to medium silty/clayey sand and medium to coarse sand size shell fragments in cuttings
		SC						
					125			

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-301A** Contract Number: 06120048 Sheet: 5 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
								120.0 - 140.0 ft: smooth drilling, uniform drilling resistance, gray drilling fluid, fine to medium silty/clayey sand and medium to coarse sand size shell fragments in cuttings *(continued)*
					130			
					135			
					140			140.0 ft: desanded drilling fluid 140.0 - 160.0 ft: uniform drilling resistance, smooth drilling, greenish gray drilling fluid, fine to medium silty/clayey sand clumps and medium to coarse sand size shell fragments in cuttings
		SC			145			
					150			
					155			

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-301A** Contract Number: 06120048 Sheet: 6 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
160.0	160.0 - 180.0 ft: SANDY SILT, fine grained sand	ML	-63.3		165 170 175			160.0 - 180.0 ft: uniform drilling resistance, smooth drilling, greenish gray drilling fluid, fine silty/clayey sand and fine sandy silt and few medium to coarse shell fragments in cuttings
180.0	180.0 - 195.0 ft: SILTY SAND, fine grained sand	SM	-83.3		180 185 190			180.0 - 198.0 ft: uniform drilling resistance, smooth drilling, greenish gray drilling fluid, clumps of fine sandy silt, fine silty sand and trace medium to coarse size shell fragments in cuttings

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-301A** Contract Number: 06120048 Sheet: 7 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SM						
195.0	195.0 - 209.0 ft: FAT CLAY; moist, olive gray with streaks of white, estimated <5% shell fragments, contains mica, estimated 5 - 10% fine grained sand, hard, highly weathered white shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)		-98.3		195			
						UD-4, UNDIST REC=23", 96%	LL = 115 PL = 25 MC = 64.1% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	198.0 - 200.0 ft: pitcher sample 198.0 - 218.0 ft: uniform drilling resistance, smooth drilling, light olive gray drilling fluid, fine sandy silt/silty sand clumps and few medium to coarse sand size shell fragments in cuttings
					200			
		CH						
					205			
209.0	209.0 - 229.0 ft: CLAYEY SAND, fine grained sand; moist, grayish green, contains mica, weak HCl reaction, hard, homogenous structure		-112.3					
					210			
					215			
		SC				UD-5, UNDIST REC=23", 96%	LL = 66 PL = 26 MC = 38.8% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	218.0 - 220.0 ft: pitcher sample 218.0 - 238.0 ft: uniform drilling resistance, light olive gray drilling fluid, clumps of fine sandy silt/silty sand in cuttings
					220			
					225			

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-301A** Contract Number: 06120048 Sheet: 8 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SC						218.0 - 238.0 ft: uniform drilling resistance, light olive gray drilling fluid, clumps of fine sandy silt/silty sand in cuttings *(continued)*
229.0	229.0 - 249.0 ft: SANDY FAT CLAY, fine grained sand; moist, grayish green with speckles of white, estimated <5% shell fragments, contains mica, medium sand sized moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)		-132.3		230			
					235			
		CH			240	UD-6, UNDIST REC=23", 96%	LL = 96 PL = 26 MC = 49.2% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	238.0 - 240.0 ft: pitcher sample 238.0 - 258.0 ft: uniform drilling resistance, smooth drilling, greenish gray drilling fluid, fine sandy silt/silty sand and few medium to coarse size shell fragments in cuttings
					245			
249.0	249.0 - 264.0 ft: FAT CLAY WITH SAND, fine grained sand; moist, grayish green, contains mica, weak HCl reaction, hard, homogenous structure		-152.3		250			
		CH			255			
					260	UD-7, UNDIST REC=24", 100%	LL = 113 PL = 31 MC = 58.6% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	258.0 - 260.0 ft: pitcher sample

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-301A** Contract Number: 06120048 Sheet: 9 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		CH						258.0 - 268.0 ft: uniform drilling resistance, smooth drilling, light olive gray drilling fluid, clumps of silt/fine sandy silt and few medium sand size shell fragments in cuttings *(continued)*
264.0	264.0 - 284.0 ft: FAT CLAY WITH SAND; moist, light olive gray, contains mica, estimated <5% fine grained sand, weak HCl reaction, very hard, homogenous structure		-167.3		265			
					270	UD-8, UNDIST REC=22", 92%	LL = 182 PL = 49 MC = 85.7% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	268.0 - 270.0 ft: pitcher sample 268.0 - 278.0 ft: slightly harder drilling, uniform drilling resistance, grayish green drilling fluid; clumps of silt and very few medium sand size shell fragments in cuttings
		CH			275			
	278.0 ft: Changes to dark grayish green, estimated 5 - 10% fine grained sand, hard				280	UD-9, UNDIST REC=23", 96%	LL = 187 PL = 54 MC = 109.8% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	278.0 - 280.0 ft: pitcher sample 278.0 - 288.0 ft: uniform drilling resistance, smooth drilling, grayish green drilling fluid, clumps of silt in cuttings
284.0	284.0 - 294.0 ft: SANDY FAT CLAY, fine grained sand; moist, grayish green, contains mica, strong HCl reaction, hard, homogenous structure		-187.3		285			
		CH			290	UD-10, UNDIST REC=24", 100%	LL = 115 PL = 30 MC = 57.4% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	288.0 - 290.0 ft: pitcher sample 288.0 - 298.0 ft: uniform drilling resistance, smooth drilling, dark greenish gray drilling fluid, fine sandy silt and silty clumps in cuttings
294.0	294.0 - 304.0 ft: FAT CLAY; moist, *(continued)*	CH	-197.3					

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-301A** Contract Number: 06120048 Sheet: 10 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	grayish green, estimated 5 - 10% fine grained sand, contains mica, weak HCl reaction, hard, homogenous structure	CH			295 300	UD-11, UNDIST REC=24", 100%	LL = 135 PL = 35 MC = 94.2% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	298.0 - 300.0 ft: pitcher sample 298.0 - 303.0 ft: uniform drilling resistance, smooth drilling, dark greenish gray drilling fluid 303.0 ft: harder drilling with intermittent rig chatter
304.0	304.0 - 314.0 ft: CLAYEY SAND, fine to coarse grained sand; moist, dark olive gray and dark gray, estimated 5 - 10% shell fragments, medium sand size moderately weathered shells fragments, strong HCl reaction (with shell and soil), medium sand and medium sand sized shell fragments difficult to discern from one another (shell fragments appear more opaque and light brownish white in color)	SC	-207.3		305 310	UD-12, UNDIST REC=23", 96%	LL = 56 PL = 17 MC = 24.6% PP = 3.50 tsf PP = 4.00 tsf PP = 4.00 tsf	308.0 - 310.0 ft: pitcher sample : bottom 1/4 inch of tube dented but does not appear to have affected sample 308.0 - 318.0 ft: slightly harder drilling, intermittent minor rig chatter, light olive gray drilling fluid
314.0	314.0 - 324.0 ft: CLAYEY SAND WITH GRAVEL, fine to coarse grained sand, rounded particles; moist, dark gray and greenish gray, estimated 50 - 100% cemented sands, quartzite coarse sand, subrounded to subangular fine to coarse gravel, black glauconite, strong HCl reaction (with cemented sand and soil), large ~2 1/2" diameter piece of cemented sands in bottom of tube	SC	-217.3		315 320	UD-13, UNDIST REC=23", 96%	LL = 36 PL = 14 MC = 13.4% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	318.0 - 320.0 ft: pitcher sample ; bottom 1/4 inch of tube deformed (possibly by gravel sized cemented sand) 318.0 - 323.0 ft: uniform drilling resistance, smooth drilling, light greenish gray drilling fluid
324.0	324.0 - 334.0 ft: CLAYEY SAND, fine to coarse grained sand, rounded to subrounded particles; moist, dark gray with mottles of dark bluish gray, estimated <5% shell fragments, contains mica, medium to coarse sand sized fresh shell fragments, weak HCl reaction (with shells and soil), difficult to differentiate HCl reaction between shells and soil,	SC	-227.3		325			323.0 - 324.0 ft: hard drilling with rig chatter (possibly cemented sand/gravelly layer0 324.0 ft: easier drilling

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-301A** Contract Number: 06120048 Sheet: 11 of 11

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	glauconitc	SC			330	UD-14, UNDIST REC=24", 100%	LL = 79 PL = 20 MC = 27.0% PP = 1.50 tsf PP = 1.50 tsf PP = 1.25 tsf	328.0 - 330.0 ft: pitcher sample ; bottom edge of tube slightly deformed (possibly due to soil density) *(continued)* 328.0 - 338.0 ft: uniform drilling resistance, smooth drilling; 6 inch layer of rig chatter at 330.0 ft, gray drilling fluid *(continued)*
334.0	334.0 - 344.0 ft: CLAYEY SAND, fine to coarse grained sand; moist, dark olive gray and dark gray, contains mica, weak HCl reaction		-237.3		335			
		SC			340	UD-15, UNDIST REC=22", 92%	LL = 66 PL = 22 MC = 44.5% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	338.0 - 340.0 ft: pitcher sample 338.0 - 348.0 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
344.0	344.0 - 350.0 ft: SILTY SAND, fine to medium grained sand; moist, dark olive gray and dark blackish gray, estimated 5 - 10% mica, weak HCl reaction, fine to medium sand sized mica flakes, glauconitic		-247.3		345			
		SM						
					350	UD-16, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	348.0 - 350.0 ft: pitcher sample
350.0			-253.3					

Bottom of Boring at 350.0 ft.

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

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-301B** Contract Number: 06120048 Sheet: 1 of 4

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: J. Evans

Schnabel Representative: W. Bradfield

Equipment: Failing 1500; N Rods

Method: 6" O.D. Drag Bit (Mud Rotary)

Hammer Type: Auto Hammer (140 lb)

Dates Started: 8/25/08 **Finished:** 8/26/08

North: 217002.6 ft **East:** 960819.2 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 96.8 (ft) **Total Depth:** 120.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Start of Day	8/26	7:28 AM	6.2'	---	---
Completion	8/26	10:45 AM	-0.6'	---	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	0.0 - 25.0 ft: SILTY SAND	SM			5 10 15 20			0.0 ft: Material descriptions and USCS symbols are based on observations of cuttings contained in drilling fluid and limited UD samples where available. These descriptions, symbols and boundaries provide a general indication of material changes with depth 0.0 ft: but do not represent detailed conditions. Refer to B-301 of the 2006 investigation for more detailed material descriptions in this area. 0.0 ft: advanced 6" OD drag bit (mud-rotary) to 120 ft 0.0 ft: uniform drilling resistance, smooth drilling, light brown drilling fluid. 10.0 ft: drilling fluid becomes yellowish brown 17.0 ft: hard drilling, significant rig chatter (possible gravel layer), light yellowish brown drilling fluid 17.5 ft: easier drilling, uniform drilling resistance, smooth drilling

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-301B** Contract Number: 06120048 Sheet: 2 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
25.0	25.0 - 35.0 ft: LEAN CLAY	CL	71.8		30			25.0 ft: light grayish brown drilling fluid
35.0	35.0 - 65.0 ft: SANDY LEAN CLAY	CL	61.8		35 40 45 50 55			35.0 ft: sandy lean clay cuttings, gray

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-301B** Contract Number: 06120048 Sheet: 3 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		CL			60			
65.0	65.0 - 73.0 ft: CLAYEY SAND, fine to medium grained sand	SC	31.8		65 70			65.0 ft: slight rig chatter, slightly harder drilling, mostly medium to coarse sand sized fresh shell fragments with some clumps of fine to medium clayey sand in cuttings
73.0	73.0 - 78.0 ft: SILTY SAND	SM	23.8		75			73.0 ft: very hard drilling, significant rig chatter (possibly cemented sand layer) light grayish brown drilling fluid 74.0 ft: light brownish gray drilling fluid, very slow penetration rate, cemented sands/shells cuttings (moderate to strongly cemented sands/shells) 77.0 ft: easier drilling, smooth drilling, uniform drilling resistance 78.0 - 80.0 ft: pitcher sample bottom 1/4 of tube slightly deformed (possibly due to cemented sands) 78.0 - 88.0 ft: moderately hard drilling with rig chatter
78.0	78.0 - 84.0 ft: SILTY SAND WITH GRAVEL, fine to medium grained sand; moist, light brownish gray with mottles of dark brown, estimated 30 - 45% cemented sands, estimated 5 - 10% shell fragments, medium sand to fine gravel size fresh to moderately weathered shell fragments, coarse sand to coarse gravel sized cemented sands, strong HCl reaction (with shells), weak HCl reaction (with cemented sands and soil), weak to moderate cementation	SM	18.8		80	UD-1, UNDIST REC=24", 100%	PP = 3.75 tsf PP = 4.25 tsf PP > 4.50 tsf	
84.0	84.0 - 105.0 ft: SILTY SAND, fine to medium grained sand; moist, gray with speckles of light brownish white, estimated <5% shell fragments, contains mica, medium to coarse sand size light brownish white fresh to moderately weathered shell fragments, weak to strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	12.8		85 90	UD-2, UNDIST REC=23", 96%	PP = 1.75 tsf PP = 2.00 tsf PP = 1.75 tsf	88.0 - 90.0 ft: pitcher sample 88.0 - 98.0 ft: easier drilling, uniform drilling resistance, smooth drilling

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-301B** Contract Number: 06120048 Sheet: 4 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SM			95 100	UD-3, UNDIST REC=24", 100%	PP = 4.25 tsf PP > 4.50 tsf PP > 4.50 tsf	88.0 - 98.0 ft: easier drilling, uniform drilling resistance, smooth drilling *(continued)* 98.0 - 100.0 ft: pitcher sample 98.0 - 108.0 ft: uniform drilling resistance, smooth drilling, light brownish gray drilling fluid, fine to medium clayey/silty sand and medium to coarse sand size shell fragments in cuttings
105.0	105.0 - 114.0 ft: SILTY SAND, fine to medium grained sand; moist, gray with streaks of white, estimated 15 - 25% cemented sands, estimated 15 - 25% shell fragments, medium to coarse sand size white and light brown fresh to highly weathered shell fragments, weak to strong HCl reaction (with shells), weak HCl reaction (with cemented sands and soil)	SM	-8.2		105 110	UD-4, UNDIST REC=24", 100%	PP = 1.25 tsf PP = 1.25 tsf PP = 1.00 tsf	105.0 ft: harder drilling, significant rig chatter (possible shells and cemented sands) 108.0 - 110.0 ft: pitcher sample bottom 1/2 inch deformed 108.0 - 118.0 ft: hard drilling, uniform drilling resistance drilling, light brownish gray drilling fluid
114.0	114.0 - 120.0 ft: SILTY SAND, fine to medium grained sand; moist, light greenish gray with speckles of white, estimated 5 - 10% shell fragments, medium to coarse sand size white moderately to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-17.2		115 120	UD-5, UNDIST REC=24", 100%	PP = 3.75 tsf PP = 3.75 tsf PP = 3.50 tsf	118.0 - 120.0 ft: pitcher sample
120.0			-23.2					

Bottom of Boring at 120.0 ft.
Boring backfilled with cement/bentonite grout upon completion.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-342** Contract Number: 06120048 Sheet: 1 of 19

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

North: 217217.6 ft **East:** 960272.9 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 75.7 (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'	---
Start of Day	8/4	8:45 AM	7.0'	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	SAMPLING DATA	TESTS	REMARKS
	0.0 - 0.5 ft: Rootmat and topsoil; organics					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
0.5	0.5 - 8.4 ft: POORLY GRADED SAND WITH SILT, medium grained sand; moist, orangish brown, contains mica, no HCl reaction	SP-SM	75.2			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	67.3					8.4 - 9.0 ft: jar labeled as S-4B
	9.5 ft: Changes to no mica							

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-342** Contract Number: 06120048 Sheet: 2 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SC				S-5, SPT 1+1+2 REC=13", 72%		
12.0	12.0 - 14.5 ft: LEAN CLAY WITH SAND; moist, gray, contains mica, no HCl reaction, soft, homogenous structure	CL	63.7			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	61.2		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	58.2		20	S-8, SPT 2+3+3 REC=18", 100%		

(continued)

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-342** Contract Number: 06120048 Sheet: 3 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING 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	43.7			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	41.2		35	S-14, SPT 3+3+4 REC=18", 100%		

(continued)

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-342** Contract Number: 06120048 Sheet: 4 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
37.0	37.0 - 39.5 ft: SILTY SAND, fine to medium grained sand; moist, gray, contains mica, no HCl reaction, homogenous structure	SM	38.7			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	36.2		40	S-16, SPT 33+49+50/3" REC=15", 100%		40.0 - 40.5 ft: jar labeled as S-16A 40.0 - 41.0 ft: uniform drilling resistance
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	35.2					40.5 - 41.3 ft: jar labeled as S-16B 41.0 - 42.5 ft: hard drilling
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 shells, no HCl reaction with soil	SP-SM	33.7			S-17, SPT 23+24+36 REC=18", 100%		42.5 - 45.0 ft: uniform drilling resistance
	44.5 ft: Changes to estimated 15 - 25% shell fragments				45	S-18, SPT 19+43+50/4" REC=16", 100%		45.0 - 47.5 ft: light gray drilling fluid
	45.8 ft: Changes to laminated							
	47.5 ft: Changes to estimated 5 - 10% shell fragments, highly weathered shell fragments					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	26.2		50	S-20, SPT 7+11+16		50.0 - 51.5 ft: jar labeled as S-20A

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-342** Contract Number: 06120048 Sheet: 5 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP-SM				REC=18", 100%		50.0 - 51.5 ft: jar labeled as S-20A *(continued)* 51.0 - 51.5 ft: jar labeled as S-20B
51.0	51.0 - 52.0 ft: LEAN CLAY, fine grained sand; moist, gray, estimated 5 - 10% shell fragments, weak HCl reaction	CL	24.7					
52.0	52.0 - 54.5 ft: SANDY LEAN CLAY, fine grained sand; moist, gray, contains mica, no HCl reaction, hard, homogenous structure	CL	23.7			S-21, SPT 4+4+6 REC=18", 100%		
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	21.2		55	S-22, SPT 4+4+5 REC=18", 100%		
						S-23, SPT 3+4+6 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	15.7		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	14.2			S-25, SPT 6+22+10 REC=18", 100%		62.5 - 64.5 ft: rod chatter

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-342** Contract Number: 06120048 Sheet: 6 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP-SM						62.5 - 64.5 ft: rod chatter *(continued)*
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	11.2		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	8.7			S-27, SPT 3+5+6 REC=18", 100%		
	70.0 ft: 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, gravel as fresh to moderately weathered shell fragments, weak HCl reaction (with shells)	GM	3.2			S-29, SPT 50/4" REC=4", 100%		72.5 - 74.0 ft: hard drilling
74.0	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)	SP-SM	1.7		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	77.0 - 82.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand; wet, gray, *(continued)*	SP-SM	-1.3					

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-342** Contract Number: 06120048 Sheet: 7 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	contains mica, no HCl reaction	SP-SM				S-31, SPT 5+4+6 REC=18", 100%		
					80	S-32, SPT 3+5+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	-6.3			S-33, SPT 3+3+5 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	-8.8		85	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	-11.3			S-35, SPT 5+35+38 REC=18", 100%		87.5 - 88.0 ft: uniform drilling resistance 88.0 - 90.0 ft: hard drilling
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	SP-SM	-13.8		90	S-36, SPT 7+46+50/4" REC=16", 100%		

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DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	HCl reaction (with shells), no HCl reaction (with soil)	SP-SM						
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	-16.3			S-37, SPT 7+50/6" REC=12", 100%		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
94.5	94.5 - 98.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand; wet, gray, estimated <5% shell fragments, contains cemented sands, contains mica, highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-18.8		95	S-38, SPT 39+20+16 REC=18", 100%		95.0 - 98.5 ft: uniform drilling resistance, gray drilling fluid
98.0	98.0 - 107.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand; moist, gray, contains shell fragments, contains mica, no HCl reaction	SP-SM	-22.3		100	S-39, SPT 6+9+13 REC=18", 100%		98.5 - 103.5 ft: marsh funnel test performed, 40 sec drilling fluid
	103.5 ft: Changes to fine to medium grained sand; homogenous structure, weak HCl reaction (with shells), no HCl reaction (with soil)					S-40, SPT 7+8+11 REC=18", 88%		103.5 - 108.5 ft: light gray drilling fluid

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DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
								103.5 - 108.5 ft: light gray drilling fluid *(continued)*
					105			
		SP-SM						
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)		-31.8					
						S-41, SPT 6+9+14 REC=18", 100%		
					110			
		SM						
						S-42, SPT 5+7+10 REC=18", 100%		
	114.4 ft: Changes to contains highly weathered shell inclusions ~ 1 inch thick				115			
117.5	117.5 - 122.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand; *(continued)*	SP-SM	-41.8					

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-342** Contract Number: 06120048 Sheet: 10 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	wet, gray, estimated 5 - 10% shell fragments, contains mica, highly weathered shell fragments	SP-SM			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	-46.8		125	S-44, SPT 6+6+10 REC=18", 100%		
	128.5 ft: Changes to contains shell fragments, weak HCl reaction				130	S-45, SPT 5+8+11 REC=18", 100%		128.5 - 133.5 ft: no solid cuttings

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-342** Contract Number: 06120048 Sheet: 11 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SM						128.5 - 133.5 ft: no solid cuttings *(continued)*
132.5	132.5 - 138.0 ft: SANDY SILT, fine grained sand; moist, gray, contains mica, weak HCl reaction, homogenous structure		-56.8					
						S-46, SPT 7+10+13 REC=18", 100%		
		ML			135			
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		-62.3					
						S-47, SPT 3+5+7 REC=18", 100%		
		ML			140			
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)		-66.8					
		ML				S-48, SPT 6+8+11 REC=18", 100%		

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DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		ML			145			
147.5	147.5 - 182.5 ft: SANDY SILT, fine grained sand; moist, brownish gray, contains mica, weak HCl reaction		-71.8					
						S-49, SPT 6+10+11 REC=18", 100%		
					150			
		ML						
	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
					155			

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DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
						S-51, SPT 6+9+13 REC=18", 100%		
					160			
						S-52, SPT 7+9+11 REC=18", 100%		
		ML			165			
						S-53, SPT 7+8+10 REC=7", 39%		
					170			

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DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
						S-54, SPT 5+8+14 REC=18", 100%		
					175			
		ML						
						S-55, SPT 7+8+11 REC=18", 100%		
					180			
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		-106.8					
		ML				S-56, SPT 6+8+8 REC=18", 100%		
					185			

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-342** Contract Number: 06120048 Sheet: 15 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		ML						
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		-111.3					
						S-57, SPT 6+8+13 REC=18", 100%		
					190			
		SP-SM						
						S-58, SPT 4+7+13 REC=18", 100%		
					195			
197.5	197.5 - 207.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand; wet, gray, contains mica, no HCl reaction		-121.8					
		SP-SM						
						S-59, SPT		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-342** Contract Number: 06120048 Sheet: 16 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
						4+6+11 REC=18", 100%		198.5 - 203.5 ft: uniform resistance, gray drilling fluid *(continued)*
					200			
		SP-SM						
	203.5 ft: Changes to moist					S-60, SPT 5+7+13 REC=18", 100%		
					205			
207.5	207.5 - 212.5 ft: SILTY SAND, fine grained sand; moist, gray, contains mica, no HCl reaction		-131.8					
						S-61, SPT 5+7+11 REC=18", 100%		
		SM			210			

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-342** Contract Number: 06120048 Sheet: 17 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
212.5	212.5 - 242.5 ft: SANDY SILT, fine grained sand; moist, gray, contains mica, no HCl reaction, hard, homogenous structure	SM	-136.8					
						S-62, SPT 6+9+12 REC=18", 100%		213.5 - 215.0 ft: sandy silt cuttings
					215			
	218.5 ft: Changes to weak HCl reaction	ML				S-63, SPT 7+10+14 REC=18", 100%		
					220			
						S-64, SPT 6+8+13 REC=18", 100%		
					225			

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-342** Contract Number: 06120048 Sheet: 18 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	228.5 ft: Changes to brownish gray					S-65, SPT 7+10+13 REC=18", 100%		
					230			
		ML						
						S-66, SPT 7+8+12 REC=18", 100%		
					235			
						S-67, SPT 6+9+16 REC=18", 100%		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-342** Contract Number: 06120048 Sheet: 19 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		ML			240			
242.5	242.5 - 250.0 ft: SANDY SILT, fine grained sand; moist, olive gray, contains mica, weak HCl reaction, firm, homogenous structure		-166.8					
						S-68, SPT 6+7+15 REC=17", 94%		243.5 - 248.5 ft: uniform drilling resistance, gray drilling fluid
					245			
		ML						
						S-69, SPT 9+11+16 REC=18", 100%		
250.0			-174.3		250			

Bottom of Boring at 250.0 ft.
Boring backfilled with cement/bentonite grout upon completion.

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-343** Contract Number: 06120048 Sheet: 1 of 8

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

North: 217037.8 ft **East:** 960306.8 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 83.1 (ft) **Total Depth:** 250.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/28	---	14.0'	13.0'	---
Start of Day	7/29	7:00 AM	7.0'	13.0'	---
Start of Day	7/30	7:19 AM	7.5'	13.0'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.4	0.0 - 0.4 ft: ORGANIC SOIL		82.7			S-1, SPT WOH/12"+2 REC=10", 71%		0.0 ft: Advanced 4-1/4" I.D. HSA to 13.0 ft.
	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 REC=5", 28%		
4.5	4.5 - 5.9 ft: POORLY GRADED SAND, medium grained sand; moist, orangish brown, no HCl reaction	SP	78.6		5	S-3, SPT 2+2+3 REC=18", 100%		5.0 - 5.9 ft: jar labeled as S-3A
5.9	5.9 - 7.0 ft: SILTY SAND, medium grained sand; moist, orangish brown, no HCl reaction	SM	77.2					5.9 - 6.5 ft: jar labeled as S-3B
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	76.1			S-4, SPT 2+3+4 REC=15", 83%		
					10	S-5, SPT 7+1+2 REC=18", 100%		
12.0	12.0 - 12.9 ft: SILTY SAND, medium grained sand; moist, orangish brown with mottles of white, no HCl reaction	SM	71.1					
12.9	12.9 - 14.5 ft: POORLY GRADED SAND WITH SILT, medium grained sand; moist, gray, contains mica, no HCl reaction	SP-SM	70.2			S-6, SPT 1+2+2 REC=18", 100%		12.5 - 12.9 ft: jar labeled as S-6A 12.9 - 14.0 ft: jar labeled as S-6B
14.5	14.5 - 17.5 ft: SILTY SAND; moist, gray, contains mica, no HCl reaction	SM	68.6		15	S-7, SPT WOH+1+3 REC=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
17.5	17.5 - 19.0 ft: LEAN CLAY WITH SAND, fine grained sand; wet, gray, contains mica, no HCl reaction	CL	65.6					
19.0	19.0 - 22.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand; wet, gray, contains mica, no HCl reaction	SP-SM	64.1		20	S-8, SPT 3+4+5 REC=18", 100%		13.0 - 15.0 ft: Uniform drilling resistance, light brown drilling fluid, enountered water at 14.0 ft. 18.5 - 19.0 ft: jar labeled as S-8A
22.5	22.5 - 27.0 ft: SANDY LEAN CLAY, fine grained sand; moist, gray, contains mica, no HCl reaction	CL	60.6			S-9, SPT 2+3+4 REC=18", 100%		19.0 - 20.0 ft: jar labeled as S-8B 23.5 - 28.5 ft: light gray drilling fluid

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-343** Contract Number: 06120048 Sheet: 2 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		CL						23.5 - 28.5 ft: light gray drilling fluid *(continued)*
27.0	27.0 - 39.5 ft: LEAN CLAY, fine grained sand; moist, gray, contains mica, no HCl reaction		56.1					
						S-10, SPT 3+3+5 REC=18", 100%		
					30			
	32.5 ft: Changes to firm	CL				S-11, SPT 3+4+4 REC=18", 100%		32.5 - 35.0 ft: white drilling fluid
	35.0 ft: Changes to hard				35	S-12, SPT 4+5+6 REC=18", 100%		
						S-13, SPT 4+7+9 REC=18", 100%		
39.5	39.5 - 42.0 ft: CLAYEY SAND, fine grained sand; moist, gray, contains mica, no HCl reaction	SC	43.6		40	S-14, SPT 5+5+7 REC=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	41.1					
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	40.1			S-15, SPT 4+9+10 REC=18", 100%		42.5 - 43.0 ft: jar labeled as S-15A 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	38.6		45	S-16, SPT 8+13+19 REC=18", 100%		45.0 - 47.5 ft: increased drilling resistance at 46.0 ft, light gray drilling fluid
47.0	47.0 - 48.0 ft: SILTY SAND, fine grained sand; moist, gray, contains cemented sands, contains mica, no HCl reaction	SM	36.1			S-17, SPT 41+45+35 REC=18", 100%		47.5 - 50.0 ft: uniform drilling resistance, light gray drilling fluid 47.5 - 48.0 ft: jar labeled as S-17A
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	35.1		50	S-18, SPT 38+50/3" REC=9", 100%		48.0 - 49.0 ft: jar labeled as S-17B
49.5	49.5 - 52.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand; moist, gray, no HCl reaction	SP-SM	33.6			S-19, SPT 50/3" REC=3", 100%		
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	30.6		55	S-20, SPT 23+18+19 REC=12", 67%		
57.8	57.5 ft: Changes to strong HCl reaction (with shells), weak HCl reaction (with	ML	25.3			S-21, SPT 7+6+6 REC=15", 83%		57.5 - 57.8 ft: jar labeled as S-21A

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-343** Contract Number: 06120048 Sheet: 3 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	soil)							57.8 - 59.0 ft: jar labeled as S-21B *(continued)*
	57.8 - 64.5 ft: SANDY SILT, fine grained sand; moist, gray, contains mica, no HCl reaction 60.0 ft: Changes to weak HCl reaction 63.6 ft: Changes to contains shell fragments	ML			60	S-22, SPT 4+4+5 REC=18", 100% S-23, SPT 4+4+5 REC=18", 100%		
64.5			18.6					
	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			65	S-24, SPT 50/1" REC=1", 100%		65.0 - 67.5 ft: uniform, but considerable drilling resistance, light gray drilling fluid
67.0			16.1					
	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 reacton (with soil)	SP-SM				S-25, SPT 7+7+10 REC=18", 100%		67.5 - 69.5 ft: uniform drilling resistance
69.5			13.6					
	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			70	S-26, SPT 14+24+20 REC=18", 100%		69.5 - 70.0 ft: harder drilling 70.0 - 72.5 ft: uniform drilling resistance
72.0			11.1					
						S-27, SPT 5+4+7 REC=11", 61%		
	72.0 - 79.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand; wet, gray, estimated 5 - 10% shell fragments, contains mica, highly weathered shell fragements, weak HCl reaction (with shells), no HCl reaction (with soil) 77.5 ft: Changes to estimated 15 - 25% shell fragments	SP-SM			75	S-28, SPT 4+7+7 REC=18", 100% S-29, SPT 7+10+19 REC=18", 100%		
79.5			3.6					
	79.5 - 84.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand; wet, gray, estimated <5% shell fragments, contains mica, highly weathered shell fragements, weak HCl reaction (with shells), no HCl reaction (with soil) 82.5 ft: Changes to contains shell fragments	SP-SM			80	S-30, SPT 4+5+8 REC=18", 100% S-31, SPT 5+5+8 REC=18", 100%		
84.5			-1.4					
	84.5 - 92.0 ft: POORLY GRADED SAND WITH SILT; wet, gray, contains shell fragments, contains mica, highly weathered shell fragements, weak HCl reaction (with shells), no HCl reaction (with soil) 87.5 ft: Changes to homogenous structure	SP-SM			85 90	S-32, SPT 5+4+7 REC=18", 100% S-33, SPT 3+4+6 REC=18", 100% S-34, SPT 3+5+5 REC=18", 100%		
92.0		SP-SM	-8.9					

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-343** Contract Number: 06120048 Sheet: 4 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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				S-35, SPT 5+10+13 REC=18", 100%		
94.5			-11.4		95	S-36, SPT 50/5" REC=5", 100%		95.5 ft: hard drilling
	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 fragements, weak HCl reaction (with shells), no HCl reaction (with soil) 97.5 ft: Changes to estimated <5% shell fragments, estimated 15 - 25% cemented sands 100.0 ft: Changes to gray, contains cemented sands, sands as gravel sized fragments, weak HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM				S-37, SPT 50/2" REC=2", 100%		97.0 ft: easy drilling 98.5 ft: soft drilling
					100	S-38, SPT 50/5" REC=5", 100%		99.5 ft: hard drilling
102.0			-18.9					102.0 ft: softer drilling
	102.0 - 107.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand; moist, gray, contains shell fragments, contains mica, highly weathered shell fragements, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM				S-39, SPT 6+12+20 REC=18", 100%		102.5 - 108.5 ft: uniform drilling resistance, marsh funnel test performed, 50 sec drilling fluid
					105			
107.0			-23.9					
	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 fragements, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM				S-40, SPT 5+7+10 REC=18", 100%		
					110			
112.0			-28.9					
	112.0 - 122.5 ft: SILTY SAND, fine grained sand; moist, gray, contains mica, no HCl reaction, homogenous structure	SM				S-41, SPT 5+7+10 REC=18", 100%		
					115			
						S-42, SPT 7+7+10 REC=18", 100%		
					120			
122.5			-39.4					
	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				S-43, SPT 6+10+11 REC=18", 100%		
					125			

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-343** Contract Number: 06120048 Sheet: 5 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	128.5 ft: Changes to estimated 5 - 10% shell fragments	SM			130	S-44, SPT 5+9+21 REC=18", 100%		
	133.5 ft: Changes to shell fragments, contains shell layers at 134.2 ft				135	S-45, SPT 6+7+11 REC=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	-53.9		140	S-46, SPT 6+9+13 REC=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	-59.4		145	S-47, SPT 5+6+12 REC=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		-64.4		150	S-48, SPT 5+8+9 REC=18", 100%		
	153.5 ft: Changes to no HCl reaction, homogenous structure	ML			155	S-49, SPT 6+6+10 REC=18", 100%		
	158.5 ft: Changes to weak HCl reaction, firm					S-50, SPT 6+8+10 REC=18", 100%		158.5 - 163.5 ft: gray drilling fluid

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-343** Contract Number: 06120048 Sheet: 6 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
								158.5 - 163.5 ft: gray drilling fluid *(continued)*
	163.5 ft: Changes to hard				165	S-51, SPT 8+9+10 REC=18", 100%		
					170	S-52, SPT 5+9+11 REC=18", 100%		
					175	S-53, SPT 7+11+12 REC=15", 83%		
		ML			180	S-54, SPT 6+9+11 REC=18", 100%		
					185	S-55, SPT 4+8+9 REC=18", 100%		183.0 - 185.0 ft: sandy silt cuttings
					190	S-56, SPT 6+9+12 REC=18", 100%		
192.0	192.0 - 197.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand; moist, gray, estimated 5 - *(continued)*	SP-SM	-108.9					

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-343** Contract Number: 06120048 Sheet: 7 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	10% shell fragments, contains mica, moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM			195	S-57, SPT 8+12+15 REC=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	-114.4		200	S-58, SPT 4+7+11 REC=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	-119.4		205	S-59, SPT 5+6+11 REC=18", 100%		
207.5	207.5 - 217.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand; moist, gray, contains mica, no HCl reaction	SP-SM	-124.4		210	S-60, SPT 4+6+9 REC=18", 100%		
	213.5 ft: Changes to homogenous structure				215	S-61, SPT 5+5+10 REC=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	-134.4		220	S-62, SPT 6+7+10 REC=18", 100%		
					225	S-63, SPT 8+12+13 REC=13", 72%		

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-343** Contract Number: 06120048 Sheet: 8 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
227.5	227.5 - 232.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand; moist, gray, contains mica, weak HCl reaction	SP-SM	-144.4		230	S-64, SPT 7+8+12 REC=18", 100%		228.5 - 233.5 ft: brownish gray drilling fluid
232.5	232.5 - 242.5 ft: SILTY SAND, fine grained sand; moist, gray, contains mica, no HCl reaction	SM	-149.4		235	S-65, SPT 7+9+13 REC=18", 100%		
					240	S-66, SPT 6+7+14 REC=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	-159.4		245	S-67, SPT 5+18+13 REC=18", 100%		243.5 - 248.5 ft: uniform drilling resistance, brownish gray drilling fluid, no solid cuttings
250.0			-166.9		250	S-68, SPT 7+10+13 REC=18", 75%		

Bottom of Boring at 250.0 ft.
Boring backfilled with cement/bentonite grout upon completion.

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-344** Contract Number: 06120048 Sheet: 1 of 8

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

North: 216976.8 ft **East:** 960358 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'	---
Start of Day	7/17	7:30 AM	3.0'	8.0'	---
Start of Day	7/18	7:15 AM	20.0'	8.0'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING 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, inervaul uniform drilling resistance, light brown cuttings.
	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 /14 inch O.D. tricone roller bit (mud rotary)
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 - 19.2 ft: LEAN CLAY WITH SAND, fine grained sand; moist, gray, contains mica, no HCl reaction, soft 12.0 ft: Changes to 0.5 inch layer of silty sand between 13.0 to 13.1 ft	CL	62.8		10	S-5, SPT 2+3+3 REC=18", 100% S-6, SPT 3+2+4 REC=18", 100% S-7, SPT 3+3+4 REC=18", 100% S-8, SPT 4+10+11 REC=15", 83%		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 - 22.5 ft: uniform drilling resistance light gray drilling fluid 18.5 - 19.2 ft: jar labeled S-8A 19.2 - 20.0 ft: jar labeled S-8B
19.2	19.2 - 22.0 ft: POORLY GRADED WITH SILT, fine grained sand; moist, gray, contains mica, no HCl reaction	SP-SM	53.1		15 20			
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%		

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-344** Contract Number: 06120048 Sheet: 2 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		CL				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 29.5 ft: Changes to contains mica	SM	45.3			S-11, SPT 7+7+8 REC=18", 100%		
					30	S-12, SPT 3+4+9 REC=18", 100%		25.0 - 27.5 ft: switched to 3 /14 inch tricone roller bit, uniform drilling resistance, light gray drilling fluid
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 40.0 ft: Changes to wet	SP-SM	35.3			S-15, SPT 50/6" REC=6", 100%		
					40	S-16, SPT 22+50/5" REC=11", 100%		
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) 45.0 ft: Changes to wet, gray with bands of white	SW-SM	30.3			S-17, SPT 33+32+40 REC=18", 100%		
					45	S-18, SPT 8+14+13 REC=18", 100%		
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 50.0 ft: Changes to contains shell fragments, contains mica, no HCl reaction (with shells or soil)	ML	25.3			S-19, SPT 3+5+5 REC=18", 100%		
					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", 100%		52.0 ft: rod chatter 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
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%		
57.0	57.0 - 59.5 ft: SILTY SAND WITH GRAVEL, fine grained sand; wet, gray, contains mica, estimated 15 - 25% shell	SM	15.3			S-23, SPT 4+43+43 REC=18", 100%		55.0 - 57.5 ft: uniform drilling resistance, light gray drilling fluid

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-344** Contract Number: 06120048 Sheet: 3 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
59.5	fragments, fine gravel sized highly weathered shell fragments, weak HCL reaction (with shells), no HCl reaction (with soil)	SM	12.8					
	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) 62.5 ft: Changes to moist, contains 0.1 ft shell fragment layers at 62.8 and 63.2 ft	SP-SM			60	S-24, SPT 7+4+4 REC=18", 100% 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) 70.0 ft: Changes to contains shell fragments	SP-SM	4.8		70	S-27, SPT 5+5+7 REC=18", 100% S-28, SPT 5+5+8 REC=18", 100%		67.5 - 70.0 ft: uiform drilling resistance, light gray drilling fluid
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) 75.0 ft: Changes to no HCl reaction (with shells or soil)	SP-SM	0.3		75	S-29, SPT 4+4+5 REC=18", 100% 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 85.0 ft: Changes to light gray	SP-SM	-9.7		85	S-33, SPT 11+50/6" REC=12", 100% 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	SM	-17.2		90	S-36, SPT 9+12+12 REC=18", 100%		
92.0		SP-SM	-19.7					

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-344** Contract Number: 06120048 Sheet: 4 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	fragments, weak HCl reaction (with shells), no HCl reaction (with soil)					S-37, SPT 6+8+9 REC=18", 100%		92.5 - 98.5 ft: marsh funnel test performed, 43 sec drilling fluid
	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			95			
	98.5 ft: Changes to moist				100	S-38, SPT 6+8+11 REC=18", 100%		98.5 - 103.5 ft: uniform drilling resistance, light gray drilling fluid
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)	SM	-30.2		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				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				125	S-43, SPT 5+8+10 REC=18", 100%		

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-344** Contract Number: 06120048 Sheet: 5 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
127.0	127.0 - 132.5 ft: SANDY SILT, fine grained sand; moist, grayish brown, contains mica, weak HCl reaction, hard	SM ML	-54.7		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				145	S-47, SPT 6+8+8 REC=18", 100%		
		ML			150	S-48, SPT 6+8+12 REC=18", 100%		
					155	S-49, SPT 6+7+11 REC=18", 100%		
						S-50, SPT 6+8+9 REC=18", 100%		

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-344** Contract Number: 06120048 Sheet: 6 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	163.5 ft: Changes to homogenous structure				165	S-51, SPT 6+7+9 REC=18", 100%		163.5 - 168.5 ft: uniform drilling resistance, gray drilling fluid
	168.5 ft: Changes to firm	ML			170	S-52, SPT 6+7+9 REC=18", 100%		
	173.5 ft: Changes to hard				175	S-53, SPT 5+7+10 REC=8", 44%		
					180	S-54, SPT 7+8+10 REC=18", 100%		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: CLAYEY SAND, fine to medium grained sand; moist, grayish brown, 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.	SC	-108.7			UD-1, UNDIST REC=16", 67%	LL = 44 PL = 23 MC = 30.6% PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	181.5 - 183.5 ft: pitcher sample 28.2 sec
					185	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
					190	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	SM	-118.7			UD-2, UNDIST REC=23", 96%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	191.5 - 193.5 ft: pitcher sample

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-344** Contract Number: 06120048 Sheet: 7 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	193.5 ft: Changes to no HCl reaction, homogenous structure				195	S-57, SPT 3+5+7 REC=16", 89%		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 *(continued)*
	198.5 ft: Changes to weak HCl reaction	SM			200	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
						UD-3, UNDIST REC=12", 50%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	201.5 - 203.5 ft: pitcher sample 38.4 sec, sample placed in jar and labeled as UD-3
204.0	204.0 - 206.0 ft: SANDY FAT CLAY, fine grained sand; moist, contains mica, no HCl reaction, homogenous structure	CH	-131.7		205	UD-4, UNDIST REC=24", 100%	LL = 81 PL = 25 MC = 47.2% PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	204.0 - 206.0 ft: pitcher sample
206.0	206.0 - 217.5 ft: SILTY SAND, fine grained sand; moist, contains mica, no HCl reaction, homogenous structure	SM	-133.7			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
					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: pitcher sampler
					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 - 221.0 ft: SILTY SAND, fine grained sand; moist, brownish gray, contains mica, weak HCl reaction, firm, homogenous structure	SM	-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
221.0	221.0 - 223.5 ft: FAT CLAY WITH SAND, fine grained sand; moist, brownish gray, contains mica, weak HCl reaction, firm, homogenous structure	CH	-148.7			UD-6, UNDIST	LL = 119 PL = 31 MC = 65.5% PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	221.5 - 223.5 ft: pitcher sampler in 1 minute 22 sec, 500 lb of pressure required to push tube (hard material), 19.5 inch recovery
223.5	223.5 - 233.5 ft: SANDY SILT, fine grained sand; moist, contains mica, no HCl reaction, firm, homogenous structure	ML	-151.2		225	S-63, SPT 5+7+11 REC=18", 100%		223.5 ft: switched to 3 1/4 inch O.D.

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-344** Contract Number: 06120048 Sheet: 8 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	228.5 ft: Changes to soft	ML			230	S-64, SPT 5+8+12 REC=18", 100%		tricone roller bit and advanced roller bit to 228.5 ft, no solid cuttings 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
	231.5 ft: Changes to weak HCl reaction					UD-7, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	
233.5	233.5 - 238.0 ft: SILTY SAND, fine grained sand; moist, brownish gray, contains mica, weak HCl reaction, hard, homogenous structure	SM	-161.2		235	S-65, SPT 5+8+14 REC=16", 89%		231.5 - 233.5 ft: pitcher sample 2.97 sec 233.5 ft: switched to 3 1/4 O.D. tricone roller bit and advanced roller bit to 238.3 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
238.0	238.0 - 241.0 ft: SANDY SILT, fine grained sand; moist, grayish brown, contains mica, no HCl reaction, hard, homogeneous structure	ML	-165.7		240	S-66, SPT 7+8+12 REC=18", 100%		
241.0	241.0 - 243.5 ft: FAT CLAY; moist, brownish gray, contains mica, estimated <5% fine grained sand, weak HCl reaction, hard, homogeneous structure	CH	-168.7			UD-8, UNDIST REC=24", 100%	LL = 176 PL = 50 MC = 41.3% PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	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: pitcher sample in 52.2 sec
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%		243.5 ft: switched to 3 1/4 O.D. tricone roller bit and advanced roller bit to 248.5 ft
250.0			-177.7		250	S-68, SPT 7+9+13 REC=18", 75%		

Bottom of Boring at 250.0 ft.
Boring backfilled with cement/bentonite grout upon completion.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 1 of 19

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

North: 217097.3 ft **East:** 960392.9 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 69.6 (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	SAMPLING DATA	TESTS	REMARKS
	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				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
2.0	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	67.6			S-2, SPT 3+2+3 REC=18", 100%		
4.5	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	65.1		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
5.8	5.8 - 9.5 ft: SILTY SAND, fine grained sand; moist, olive brown and yellowish red, strong HCl reaction, homogenous structure	SM	63.8			S-4, SPT 3+4+3 REC=16", 89%		
9.5	9.5 - 12.5 ft: SANDY LEAN CLAY, fine grained sand; moist, olive brown with	CL	60.1					

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 2 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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				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
12.5	12.5 - 14.0 ft: SANDY LEAN CLAY, fine grained sand; wet, grayish purple, no HCl reaction, firm, homogenous structure	CL	57.1					
						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
14.0	14.0 - 16.5 ft: CLAYEY SAND, fine grained sand; wet, grayish purple, estimated <5% mica, no HCl reaction, homogenous structure	SC	55.6		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
16.5	16.5 - 18.0 ft: SANDY LEAN CLAY, fine grained sand; wet, grayish purple, no HCl reaction, hard, homogenous structure	CL	53.1					
18.0	18.0 - 23.0 ft: FAT CLAY; wet, grayish pink, no HCl reaction, hard, homogenous structure	CH	51.6			S-8, SPT 3+4+5 REC=18", 100%		
					20			
	21.0 ft: Changes to lensed, contains small pockets (< 0.5 in diameter) of yellowish red sands					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,	CL	46.6					

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 3 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	homogenous structure, contains 0.5 inch layer of CLAYEY SAND (SC), wet, grayish purple at 24.8 ft	CL			25	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	44.1			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 26.5 - 27.5 ft: jar labeled as S-11B
26.5	26.5 - 28.0 ft: SILTY SAND, fine grained sand; wet, grayish purple, no HCl reaction, homogenous structure	SM	43.1					27.5 ft: Schnabel representative switched from P. Patrick to K. Bell
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	41.6		30	S-12, SPT 7+10+13 REC=17", 94%		28.5 - 31.0 ft: uniform drilling resistance, harder drilling
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 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	SM	39.1			S-13, SPT 14+50/6" REC=12", 100%		31.0 - 33.5 ft: slight rig chatter at 33 ft (possible cemented sand)
33.0	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	36.6		35	S-14, SPT 33+50/4" REC=9", 90% S-15, SPT 50/5" REC=5", 100%		33.5 - 36.0 ft: hard drilling

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 4 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP-SM						
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	32.1		40	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	29.1			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	26.6		45	S-18, SPT 5+5+7 REC=16", 89%		43.5 - 46.0 ft: uniform drilling resistance, smooth drilling, light gray drilling fluid
	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					S-19, SPT 3+3+5 REC=18", 100%		46.0 - 48.5 ft: gray drilling fluid, cuttings are clayey sand, fine to medium sand, fine to medium sand sized shell cuttings
48.0	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	21.6		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)

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 5 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
50.5	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 rection with cemented sand and soil, moderate to strong cementation	SC	19.1			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
53.0	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	16.6			S-22, SPT 5+10+32 REC=16", 89%		53.5 - 56.0 ft: heavy rig chatter at 55.5 ft (possible cemented sand)
					55			
55.5	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	14.1			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			
60.5	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	SM	9.1			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		

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 6 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
						REC=15", 83%		
					65			
	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					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
		SM			70			
	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% shells, fine sand size, highly weathered shells					S-30, SPT 4+4+7 REC=18", 100%		
					75			
75.5	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 cementattion from 77.3 to 77.5	SM	-5.9			S-31, SPT 4+16+14 REC=10", 56%		76.0 - 78.5 ft: slight rig chatter at 77 ft (possible cemented sand)

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 7 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
78.0	78.0 - 83.0 ft: SILTY 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), cemented sands increase with depth	SM	-8.4			S-32, SPT 16+50/5" REC=11", 100%		76.0 - 78.5 ft: slight rig chatter at 77 ft (possible cemented sand) *(continued)*
					80			
	81.0 ft: Changes to estimated 15 - 25% shells, weak HCl reaction with shells, no HCl reaction with cemented sand and soil	SM				S-33, SPT 14+12+40 REC=17", 94%		81.0 - 83.5 ft: slight rig chatter throughout, hard drilling, light gray drilling fluid
83.0	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		-13.4			S-34, SPT 8+11+35 REC=17", 94%		83.5 - 86.0 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
					85			
	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				S-35, SPT 20+26+21 REC=17", 94%		86.0 - 88.0 ft: light gray drilling fluid
88.0	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		-18.4			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
		SM			90			

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 8 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
								88.5 - 93.5 ft: silty sand, fine to medium sand and fine to medium shell cuttings *(continued)*
	93.5 ft: Changes to fine grained sand; estimated 5 - 10% shells, weak HCl reaction with shells and soil, shell decrease with depth					S-37, SPT 11+9+10 REC=18", 100%		93.5 - 98.5 ft: uniform drilling resistance, smooth drilling
					95			
		SM						
	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					S-38, SPT 4+6+7 REC=18", 100%		
					100			
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	ML	-32.9			S-39, SPT 7+10+11 REC=18", 100%		103.5 - 108.5 ft: uniform drilling resistance, smooth drilling

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 9 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
					105			103.5 - 108.5 ft: uniform drilling resistance, smooth drilling *(continued)*
		ML						
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		-37.9					
						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
					110			
		SM						
	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					S-41, SPT 6+8+14 REC=18", 100%		
					115			
117.5	117.5 - 137.0 ft: SILTY SAND, fine grained sand; moist, olive gray and *(continued)*	SM	-47.9					

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 10 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	greenish brown, estimated <5% shells, weak HCl reaction, homogenous structure, fine to medium sand size moderate to highly weathered shells					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
120								
	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	SM				S-43, SPT 7+9+11 REC=18", 100%		
125								
						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)
130								

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 11 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
								128.5 - 133.5 ft: olive gray drilling fluid, marsh funnel test performed (41.0 sec drilling fluid) *(continued)*
	133.5 ft: Changes to fine sand size highly weathered shells	SM			135	S-45, SPT 6+9+10 REC=18", 100%		
137.0	137.0 - 142.5 ft: SILTY SAND, fine grained sand; moist, olive gray, no HCl reaction, homogenous structure	SM	-67.4		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	ML	-72.9			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

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 12 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
					145			clean water to drilling fluid and cleaned out the hole
	148.5 ft: Changes to firm					S-48, SPT 7+10+11 REC=18", 100%		148.5 - 153.5 ft: olive gray drilling fluid
					150			
		ML						
						S-49, SPT 7+9+10 REC=18", 100%		
					155			

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 13 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
						S-50, SPT 7+9+12 REC=18", 100%		
					160			
	163.5 ft: Changes to olive gray and grayish brown, lensed, 0.5 to 1.5 inch pockets of silty sand					S-51, SPT 7+9+10 REC=18", 100%		163.5 - 168.5 ft: uniform drilling resistance, smooth drilling
		ML			165			
						S-52, SPT 7+10+12 REC=18", 100%		
					170			

(continued)

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 14 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		ML			175	S-53, SPT 8+9+11 REC=18", 100%		173.5 - 178.5 ft: clumps of sandy silt and fine sand in cuttings
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	-107.9					
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 with shells, no HCl reaction with soil	SP-SM	-109.7		180	S-54, SPT 4+10+13 REC=18", 100%		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
	183.5 ft: Changes to olive gray and gray, estimated <5% shells, homogenous structure, fine sand size highly weathered shells				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

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 15 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP-SM						
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		-117.9					
						S-56, SPT 4+7+10 REC=18", 100%		188.5 - 193.5 ft: silty sand and fine sand cuttings
					190			
		SM						
						S-57, SPT 5+7+11 REC=18", 100%		
					195			
						S-58, SPT		198.5 ft: driller

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 16 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
						6+8+10 REC=18", 100%		desanded mud tub, added ~ 25 gals to drilling fluid and flushed hole with new drilling fluid
					200			
	203.0 ft: Changes to fine to medium sand size moderate to highly weathered shells							
						S-59, SPT 7+8+13 REC=18", 100%		
					205			
		SM						
	208.5 ft: Changes to fine sand size highly weathered shells					S-60, SPT 7+9+12 REC=18", 100%		208.5 ft: marsh funnel test performed (41 sec drilling fluid)
					210			

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 17 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
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	SM	-142.9					
						S-61, SPT 6+10+12 REC=18", 100%		
					215			
						S-62, SPT 6+9+11 REC=18", 100%		
		ML			220			
						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
					225			

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 18 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
								223.5 - 228.5 ft: light gray drilling fluid *(continued)*
						S-64, SPT 6+10+15 REC=18", 100%		228.5 - 233.5 ft: olive gray drilling fluid
					230			
		ML						
						S-65, SPT 7+12+17 REC=18", 100%		233.5 - 238.5 ft: slightly harder drilling
					235			
						S-66, SPT 7+13+19 REC=18", 100%		238.5 - 243.5 ft: uniform drilling resistance, smooth drilling

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-345** Contract Number: 06120048 Sheet: 19 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
					240			238.5 - 243.5 ft: uniform drilling resistance, smooth drilling *(continued)*
		ML				S-67, SPT 8+10+14 REC=18", 100%		
					245			
						S-68, SPT 6+10+15 REC=18", 100%		
250.0			-180.4		250			

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

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-346** Contract Number: 06120048 Sheet: 1 of 4

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

North: 217206.4 ft **East:** 960400.4 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	SAMPLING DATA	TESTS	REMARKS
0.5	0.0 - 0.5 ft: Rootmat and topsoil		61.3					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 cuttings.
	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	SP				S-1, SPT 1+2+2 REC=9", 50% 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		15	S-6, SPT 2+4+4 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 resitance, smooth drilling, gray drilling fluid.
17.0	17.0 - 24.0 ft: LEAN CLAY; moist, dark gray, contains mica, no HCl reaction, firm	CL	44.8		20	S-7, SPT 4+8+11 REC=18", 100%		
24.0	24.0 - 27.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand; moist,	SP-SM	37.8			S-8, SPT 7+10+15 REC=18", 91%		23.5 - 24.0 ft: Jar labeled as S-8A

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-346** Contract Number: 06120048 Sheet: 2 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	dark gray, no HCl reaction	SP-SM						24.0 - 25.0 ft: Jar labled as S-8B 23.5 - 28.5 ft: Increasing drilling resistance with depth added mud thinner at 25.0 ft *(continued)*
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		30	S-9, SPT 19+50/5" REC=8", 73%		
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		35	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		40	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		45	S-12, SPT 3+8+50 REC=18", 100%		46.0 - 48.0 ft: Bit chatter
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)	SP-SM	13.8		50	S-13, SPT 7+5+12 REC=18", 100%		48.5 - 53.5 ft: Uniform drilling reisistance, 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,	SP	4.8					

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-346** Contract Number: 06120048 Sheet: 3 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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			60	S-15, SPT 27+15+12 REC=10", 56%		58.5 - 60.0 ft: Uniform drilling reisistance, smooth drilling, gray drilling fluid *(continued)*
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 reaction. (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		70	S-17, SPT 5+6+8 REC=18", 100%		68.5 - 70.0 ft: Uniform drilling reisistance, 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 reaction (with shells), weak HCl reaction (with soil)	SM	-10.2		75	S-18, SPT 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 reisistance, smooth drilling, gray drilling fluid
92.0		SP-SM	-30.2					

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-346** Contract Number: 06120048 Sheet: 4 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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			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	S-23, SPT 9+9+12 REC=18", 100%		
100.0			-38.2					

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

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-347** Contract Number: 06120048 Sheet: 1 of 16

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

North: 217214.2 ft **East:** 960531.8 ft **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'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	0.0 - 0.3 ft: Topsoil; roots							
0.3	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	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.
2.0	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	58.2			S-2, SPT 2+2+5 REC=7", 39%		
4.5	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	55.7		5	S-3, SPT 3+4+6 REC=13", 72%		
						S-4, SPT 2+3+6 REC=14.5", 81%		7.5 - 8.1 ft: jar labeled as S-4A 8.1 - 8.8 ft: jar labeled as S-4B
8.1	8.1 - 8.8 ft: SILTY SAND, fine to medium grained sand; moist, brownish olive with mottles of light gray	SM	52.1					
8.8	8.8 - 9.5 ft: SANDY LEAN CLAY, fine grained sand; moist, dark gray, no HCl reaction, firm	CL	51.4					
9.5	9.5 - 12.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand;	SP-SM	50.7					

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-347** Contract Number: 06120048 Sheet: 2 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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				S-5, SPT 2+7+7 REC=16", 89%		
12.0	12.0 - 14.5 ft: SANDY LEAN CLAY, fine grained sand; moist, dark gray, contains mica, no HCl reaction, hard	CL	48.2			S-6, SPT 3+4+8 REC=18", 100%		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 12.5 - 15.0 ft: uniform drilling resistance, smooth drilling, light brownish gray drilling fluid
14.5	14.5 - 17.0 ft: LEAN CLAY WITH SAND; moist, dark gray, contains mica, no HCl reaction, hard	CL	45.7		15	S-7, SPT 4+7+9 REC=18", 100%		15.0 - 17.5 ft: Light gray drilling fluid
17.0	17.0 - 20.3 ft: CLAYEY SAND, fine to medium grained sand; moist, dark gray, contains mica, no HCl reaction, homogenous structure	SC	43.2			S-8, SPT 3+3+4 REC=18", 100%		
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 20.3 - 21.1 ft: jar labeled as S-9B
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) 22.5 ft: Changes to coarse grained sand	SC	39.1			S-10, SPT 9+16+50/5" REC=17", 100%		21.1 - 21.5 ft: jar labeled as S-9C 22.5 - 23.2 ft: jar labeled as S-10A
23.2	23.2 - 27.0 ft: SILTY SAND, fine to	SM	37.0					

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-347** Contract Number: 06120048 Sheet: 3 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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) 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)	SM			25	S-11, SPT 36+47+42 REC=17", 94%		23.2 - 24.0 ft: jar labeled as S-10B *(continued)* 23.5 ft: increased drilling resistance, harder drilling (possible cemented sand) added 25 lbs bentonite 25.0 - 30.0 ft: Hard drilling
27.0	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)	SP-SM	33.2			S-12, SPT 40+50/4.5" REC=9.5", 90%		
	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)				30	S-13, SPT 50+50/4" REC=9.5", 95%		30.0 ft: Added 25 lbs bentonite
32.0	32.0 - 39.5 ft: SILTY SAND, fine and coarse grained sand, angular particles; wet, gray, estimated 50 - 100% shell fragments, angular fine gravel, 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)	SM	28.2			S-14, SPT 14+29+29 REC=11.5", 64%		32.5 - 35.0 ft: Hard drilling
	35.0 ft: Changes to estimated 50 - 100% shell fragments, coarse sand sized				35	S-15, SPT 13+14+15 REC=11.5", 64%		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-347** Contract Number: 06120048 Sheet: 4 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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)	SM				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 39.0 ft: easier drilling with uniform drilling resistance
39.5	39.5 - 42.0 ft: SANDY SILT, fine grained sand; moist, dark greenish gray, contains mica, weak HCl reaction, homogenous structure	ML	20.7		40	S-17, SPT 3+2+4 REC=18", 100%		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", 100%		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, eaiser 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		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
	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	SC			50	S-21, SPT 4+3+4		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-347** Contract Number: 06120048 Sheet: 5 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
50.8	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)	SC	9.4			REC=18", 100%		50.0 - 52.5 ft: Uniform drilling resistance, smooth drilling, gray drilling fluid *(continued)* 50.0 - 50.8 ft: jar labeled as S-12A 50.8 - 51.5 ft: jar labeled as S-12B
	50.8 - 62.0 ft: SILTY SAND, fine to coarse grained sand, angular particles; 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					S-22, SPT 3+4+4 REC=18", 100%		
	55.0 ft: Changes to dark gray with brownish white, shell fragments	SM			55	S-23, SPT 6+6+8 REC=18", 100%		55.0 - 57.5 ft: Gray drilling fluid
	57.5 ft: Changes to angular to subrounded particles; dark gray with speckles of light brownish white, estimated 5 - 10% shell fragments					S-24, SPT 3+3+6 REC=18", 100%		
	60.0 ft: Changes to angular particles; medium to coarse sand sized shell fragments				60	S-25, SPT 4+5+8 REC=18", 100%		60.0 - 62.5 ft: Uniform drilling resistance smooth drilling, gray drilling fluid,
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)	SM	-1.8			S-26, SPT 3+3+7 REC=18", 100%		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-347** Contract Number: 06120048 Sheet: 6 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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)	SM			65	S-27, SPT 3+3+5 REC=18", 100%		
	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)					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	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 sand sized shell fragments, strong HCl reaction (with shells and cemented sands)	SM	-11.8			S-30, SPT 50/4" REC=4", 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)
	75.0 ft: Changes to angular particles; light gray, angular fine gravel				75	S-31, SPT 42+9+6 REC=17.5", 97%		75.0 - 77.5 ft: Hard drilling with slight rig chatter 75.0 - 75.4 ft: jar labeled as S-31A
75.4	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	-15.2					75.4 - 76.5 ft: jar labeled as S-31B 75.5 ft: drilling became easier, uniform drilling resistance, smooth drilling

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-347** Contract Number: 06120048 Sheet: 7 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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)	SM				S-32, SPT 15+11+17 REC=17", 94%		
					80	S-33, SPT 6+8+11 REC=16", 89%		80.0 - 81.2 ft: jar labeled as S-33A
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 shelll fragments, weak to strong HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	-21.0					81.2 - 81.5 ft: jar labeled as S-33B
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", 97%		85.0 - 90.0 ft: Harder drilling, rig chatter 85.0 - 86.1 ft: jar labeled as S-34A
86.1	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	-25.9					86.1 - 86.5 ft: jar labeled as S-34B
87.0	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 thoughout sample	SM	-26.8					87.0 ft: Drilling became easier
					90	S-35, SPT 5+7+8 REC=18", 100%		

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-347** Contract Number: 06120048 Sheet: 8 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SM						
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 (with shells), weak HCl reaction (with soil)	ML	-33.8		95	S-36, SPT 7+10+11 REC=18", 100%		95.0 ft: Add 20 lbs powdered bentonite to 20 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)	SM	-38.3		100	S-37, SPT 4+7+9 REC=18", 100%		103.3 ft: Drilling became harder with rig chatter (possible shell fragments)

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-347** Contract Number: 06120048 Sheet: 9 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	105.0 ft: Changes to subangular to angular particles; estimated 30 - 45% shell fragments				105	S-38, SPT 5+7+11 REC=12", 67%		104.0 ft: Drilling became easier, uniform drilling resistance
	109.0 ft: Changes to highly to moderately weathered shell fragments	SM						
	110.0 ft: Changes to dark greenish gray with speckles of light grayish white, estimated 5 - 10% 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 reaction (with shells), weak HCl reaction (with soil)	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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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-347** Contract Number: 06120048 Sheet: 10 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		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%		

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-347** Contract Number: 06120048 Sheet: 11 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SM						
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)		-73.8		135	S-44, SPT 5+6+10 REC=18", 100%		135.0 - 140.0 ft: Olive gray drilling fluid, sandy silt cuttings
		ML						
139.0	139.0 - 169.0 ft: SANDY SILT, fine grained sand; moist, olive gray, firm, homogenous structure, contains manganese, weak HCl reaction		-78.8		140	S-45, SPT 6+8+12 REC=18", 100%		140.0 - 145.0 ft: Light olive gray drilling fluid
		ML						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)

(continued)

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-347** Contract Number: 06120048 Sheet: 12 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
					145	S-46, SPT 5+8+10 REC=18", 100%		
	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%		155.0 - 160.0 ft: clumps of fine sandy silt/silty sand and some medium to coarse sized shell fragments in cuttings

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-347** Contract Number: 06120048 Sheet: 13 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING 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
		ML						
					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 reacation (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

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-347** Contract Number: 06120048 Sheet: 14 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
								171.7 ft: Drilling becomes harder with uniform drilling resistance, light olive gray drilling fluid 170.0 - 175.0 ft: Easy drilling, softer drilling resistance *(continued)*
	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)	SM			175	S-52, SPT 4+6+10 REC=7.5", 42%		175.0 - 180.0 ft: Uniform drilling resistance, smooth drilling, light oilve gray drilling fluid, fine to medium sandy silt/silty sand clumps and medium to coarse sand sized shell fragments in cuttings
179.0	179.0 - 197.5 ft: SILTY SAND, fine to medium grained sand; moist, grayish green, contains mica, no HCl reaction, homogenous structure		-118.8					
		SM			180	S-53, SPT 3+4+9 REC=18", 100%		
	185.0 ft: Changes to fine grained sand;				185	S-54, SPT		

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-347** Contract Number: 06120048 Sheet: 15 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	weak HCl reaction					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 *(continued)*
		SM			190	S-55, SPT 4+5+9 REC=16", 89%		
					195	S-56, SPT 5+6+10 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
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		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-347** Contract Number: 06120048 Sheet: 16 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
200.0		SM	-139.8		200	4+7+9 REC=18", 100%		

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

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-348** Contract Number: 06120048 Sheet: 1 of 16

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

North: 217148.9 ft **East:** 960567.4 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 68.4 (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	SAMPLING DATA	TESTS	REMARKS
	0.0 - 0.5 ft: Topsoil; forest litter, roots					S-1, SPT 2+1+1 REC=16", 89%		
0.5	0.5 - 3.5 ft: CLAYEY SAND, fine to medium grained sand; moist, yellowish red, estimated 5 - 10% roots, no HCl reaction	SC	67.9			S-2, SPT 1+2+4 REC=14", 78%		1.5 - 2.5 ft: advanced 6 1/4" OD HSA to 14.5 ft, uniform resistance, smooth drilling. 2.5 - 3.5 ft: jar labeled as S-2A
3.5	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 4.5 ft: Changes to light red, no HCl reaction, contains 3" layer of silty sand, moist, yellowish brown at 5 ft	SP-SM	64.9		5	S-3, SPT 2+7+8 REC=13", 72%		3.5 - 4.0 ft: jar labeled as S-2B 6.0 ft: light red cuttings
7.0	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	61.4			S4, SPT 2+3+4 REC=13", 72%		
9.5	9.5 - 10.3 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand;	SP-SM	58.9					

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-348** Contract Number: 06120048 Sheet: 2 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	moist, light red, no HCl reaction	SP-SM						
10.3	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 12.0 ft: Changes to fine grained sand; gray with mottles of dark yellowish brown, soft, and light gray	CL	58.1			S-5, SPT 5+5+6		10.0 - 10.3 ft: jar labeled as S-5A 10.3 - 11.5 ft: jar labeled as S-5B
12.9	12.9 - 14.5 ft: SANDY ELASTIC SILT, fine grained sand; moist, gray, contains mica, no HCl reaction, soft	MH	55.5			S-6, SPT 2+2+4 REC=18", 100%		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 red cuttings
14.5	14.5 - 17.0 ft: LEAN CLAY WITH 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	53.9		15	S-7, SPT 2+3+5 REC=18", 100%		14.5 - 16.0 ft: SPT Hammer Energy Test performed 14.5 ft: switched to 3 1/2" OD tricone roller bit caved rotary and advanced to 200.0 ft, uniform resistance, brownish gray drilling fluid
17.0	17.0 - 18.0 ft: SANDY LEAN CLAY, fine grained sand; moist, gray, contains mica, no HCl reaction, soft	CL	51.4			S-8, SPT 3+4+8 REC=18", 100%		17.5 - 18.0 ft: jar labeled as S-8A 17.5 ft: light gray drilling fluid
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	50.4					18.0 - 18.4 ft: jar labeled as S-8B
18.4	18.4 - 19.5 ft: SANDY LEAN CLAY, fine grained sand; moist, gray, contains mica, no HCl reaction, firm	CL	50.0					18.4 - 19.0 ft: jar labeled as S-8C
19.5	19.5 - 22.0 ft: LEAN CLAY WITH SAND, fine grained sand; moist, dark gray, contains mica, no HCl reaction, hard	CL	48.9		20	S-9, SPT 3+5+6 REC=18", 100%		
22.0	22.0 - 24.5 ft: LEAN CLAY; moist, gray, estimated 5 - 10% fine grained sand, no HCl reaction, hard	CL	46.4			S-10, SPT 4+6+9 REC=18", 100%		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-348** Contract Number: 06120048 Sheet: 3 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		CL						
24.5	24.5 - 29.5 ft: CLAYEY SAND, fine to medium grained sand; moist, gray, contains mica, no HCl reaction		43.9		25	S-11, SPT 3+3+4 REC=15.5", 86%		
	27.0 ft: 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%		
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	38.9		30	S-13, SPT 10+19+43 REC=18", 100%		30.0 - 31.0 ft: SPT Hammer Energy Test performed 30.5 - 32.5 ft: increased resistance, light gray; thickened mud (add 25 lbs powdered bentonite)
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 to strong cementation, coarse sand sized cemented sands crumble, fine gravel sized cemented sands fracture.	SP-SM	36.4			S-14, SPT 19+23+30 REC=16", 89%		32.5 - 35.0 ft: moderately stiff resistance, minor grinding, gray drilling fluid
34.5	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 that 1 inch layer of silt, moist, gray; weak to strong HCl reaction (with shells), no HCl reaction (with soil)	SM	33.9		35	S-15, SPT 13+21+39 REC=18", 100%		35.0 ft: uniform resistance, smooth drilling

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-348** Contract Number: 06120048 Sheet: 4 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
37.0	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 that 1/4 inch layer of silt, moist gray; weak to strong HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	31.4			S-16, SPT 34+44+44 REC=16", 89%		
39.5	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)	SM	28.9		40	S-17, SPT 18+24+39 REC=13", 72%		
42.0	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 mechnically broken fresh shells.	SP-SM	26.4			S-18, SPT 32+34+24 REC=15", 83%		44.0 - 45.0 ft: slight rig chatter
45.0	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	SM	23.4		45	S-19, SPT 13+5+6 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
45.7	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), 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)	MH	22.7			S-20, SPT 2+3+4 REC=18", 100%		
49.5	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	SM	18.9		50	S-21, SPT 50/5.5"		50.0 ft: harder drilling, minor

(continued)

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	to strong cementation	SM				REC=5.5", 100%		grinding/scraping
52.0	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 reacation (with soil), fragments; weak to strong cementation	SP-SM	16.4			S-22, SPT 50/5" REC=4", 80%		52.5 ft: hard drilling, slight grinding, trace cuttings
54.5	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),	SM	13.9		55	S-23, SPT 22+5+12 REC=18", 100%		55.0 ft: no cuttings
57.0	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),	SP-SM	11.4			S-24, SPT 5+6+7		57.5 ft: easier drilling, uniform resistance
					60	S-25, SPT 4+5+9 REC=16.5", 92%		60.0 - 61.5 ft: SPT Hammer Energy Test performed
62.0	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	SM	6.4			S-26, SPT 6+14+11 REC=17", 94%		62.5 - 65.0 ft: drilling and resistance alternated from hard to soft during run

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-348** Contract Number: 06120048 Sheet: 6 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	soil), weak to moderate cementation	SM						
64.5	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)		3.9		65	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)					S-28, SPT 4+5+8 REC=18", 100%		
	70.0 ft: Changes to no shell fragments	SM			70	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, moderate to highly weathered shell fragments				75	S-31, SPT 3+2+6 REC=18", 100%		75.0 - 76.5 ft: SPT Hammer Energy Test performed
77.0	77.0 - 80.9 ft: CLAYEY SAND, fine to coarse grained sand; moist, gray with	SC	-8.6					

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-348** Contract Number: 06120048 Sheet: 7 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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),	SC				S-31, SPT 4+5+12 REC=14", 78%		
	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 (with cemented sands), moderate to strong cementation				80	S-33, SPT 19+17+33 REC=18", 100%		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	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 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	SM	-12.5			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: 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),				85	S-35, SPT 19+16+21 REC=14", 78%		85.0 ft: uniform resistance, smooth drilling
87.0	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	-18.6			S-36, SPT 9+12+15 REC=4", 22%		
89.5	89.5 - 98.0 ft: SILTY SAND; 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	-21.1		90	S-37, SPT 6+10+13 REC=18", 100%		90.0 - 91.5 ft: SPT Hammer Energy Test performed

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-348** Contract Number: 06120048 Sheet: 8 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	93.0 ft: Changes to wet, gray, estimated <5% shell fragments, highly to moderately weathered shell fragments	SM			95	S-38, SPT 4+4+9 REC=18", 100%		93.0 ft: slightly harder drilling with rig chatter 93.5 ft: uniform resistance, smooth drilling
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	ML	-29.6		100	S-39, SPT 6+9+14 REC=18", 100%		100.0 ft: gray drilling fluid

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-348** Contract Number: 06120048 Sheet: 9 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	105.0 ft: Changes to no HCl reaction, firm	ML			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 cemetation, coarse gravel fracture	ML	-39.6		110	S-41, SPT 5+25/0" REC=6", 100%		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	-44.6		115	S-42, SPT 3+5+9 REC=18", 100%		115.0 ft: smooth drilling

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-348** Contract Number: 06120048 Sheet: 10 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING 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	ML	-49.6		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	-54.6		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	-59.6		130	S-45, SPT 4+4+5 REC=18", 100%		

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-348** Contract Number: 06120048 Sheet: 11 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SC						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		-64.6					
					135	S-46, SPT 8+10+15 REC=18", 100%		135.0 - 136.5 ft: SPT Hammer Energy Test performed
		SC						
					140	S-47, SPT 4+5+10 REC=18", 100%		140.0 - 140.8 ft: jar labeled as S-47A
140.8	140.8 - 158.0 ft: SANDY LEAN CLAY, fine to medium grained sand; moist, olive gray, contains mica, weak HCl reaction, firm		-72.4					140.8 - 141.5 ft: jar labeled as S-47B
		CL						

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-348** Contract Number: 06120048 Sheet: 12 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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)
158.0	158.0 - 168.0 ft: SILTY SAND, fine to	SM	-89.6					

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-348** Contract Number: 06120048 Sheet: 13 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	medium grained sand; moist, olive gray, contains mica, strong HCl reaction							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
		SM						
					165			165.0 - 166.5 ft: SPT Hammer Engergy Test performed
168.0	168.0 - 179.0 ft: SILTY SAND, fine to medium grained sand; moist, olive gray, contains mica, strong HCl reaction		-99.6					
		SM			170	S-53, SPT 6+7+10 REC=18", 100%		

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-348** Contract Number: 06120048 Sheet: 14 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	173.0 ft: Changes to weak HCl reaction							
		SM			175	S-54, SPT 5+8+10 REC=18", 100%		
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)		-110.6					
					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)
		SP-SM						
185.0	185.0 - 193.0 ft: SILTY SAND, fine to	SM	-116.6		185			

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-348** Contract Number: 06120048 Sheet: 15 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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)					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 *(continued)* 186.5 - 190.0 ft: fine to medium sand with clumps of clays/silt in cuttings
		SM						
	190.0 ft: Changes to no HCl reaction				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		-124.6					
		MH			195	S-58, SPT 4+6+14 REC=18", 100%		195.0 - 196.5 ft: SPT Hammer Energy Test performed
						S-59, SPT		

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-348** Contract Number: 06120048 Sheet: 16 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
200.0		MH	-131.6		200	4+5+8 REC=9.5", 53%		

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

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-349** Contract Number: 06120048 Sheet: 1 of 4

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

North: 217396.4 ft **East:** 960537.5 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'	---
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	SAMPLING 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.
1.5	1.5 - 2.0 ft: SILTY SAND, medium to coarse grained sand, subangular particles; moist, brown, estimated <5% fine gravel, no HCl reaction	SM	52.9					
2.0	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	52.4			S-2, SPT 2+4+6 REC=15", 83%		
4.5		SP-SM	49.9		5	S-3, SPT 3+4+3 REC=15", 83%		5.0 - 7.5 ft: orangish brown cuttings 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		48.3			S-4, SPT 1+2+5 REC=18", 100%		6.1 - 6.5 ft: jar labeled as S-3B 7.8 ft: dark gray cuttings
	6.1 - 12.5 ft: LEAN CLAY; moist, dark gray, contains mica, no HCl reaction, soft 7.5 ft: Changes to firm	CL			10	S-5, SPT 2+5+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	12.5 - 17.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand; moist, dark gray, contains mica, no HCl reaction	SP-SM	41.9		15	S-6, SPT 2+4+6 REC=18", 100%		9.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid 10.0 - 13.5 ft: large pieces of lean clay cuttings
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		20	S-7, SPT 50/5" REC=5", 100%		18.5 - 23.5 ft: increased resistance
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	SP	31.9			S-8, SPT 50/5" REC=5", 100%		

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-349** Contract Number: 06120048 Sheet: 2 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	fragments, strong HCl reaction (with shells), strong HCl reaction (with soil)	SP						23.5 - 28.5 ft: uniform drilling resistance, gray drilling fluid *(continued)*
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", 90%		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
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 - 98.5 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	SP	-2.6					

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-349** Contract Number: 06120048 Sheet: 3 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	fragments, coarse sand size highly weathered shell fragments, no HCl reaction (with shells), no HCl reaction (with soil)	SP			60	S-15, SPT 5+5+7 REC=18", 100%		53.5 - 98.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid *(continued)*
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%		
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, strong HCl reaction (with shells), weak HCl reaction (with soil)		-17.6		75	S-18, SPT 11+12+17 REC=18", 100%		
	78.5 ft: Changes to moist	SP-SM			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,				85	S-20, SPT 9+10+15 REC=18", 100%		
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%		

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-349** Contract Number: 06120048 Sheet: 4 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
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%		53.5 - 98.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid *(continued)*
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		100	S-23, SPT 6+12+50 REC=18", 100%		
100.0			-45.6					

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

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-350** Contract Number: 06120048 Sheet: 1 of 4

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

North: 217516.2 ft **East:** 960789 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	SAMPLING DATA	TESTS	REMARKS
	0.0 - 1.0 ft: Topsoil; contains roots							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.
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%		
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		15	S-6, SPT 2+2+2 REC=10", 56%		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
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	29.6		20	S-7, SPT 6+2+3 REC=11", 61%		18.5 - 23.5 ft: brownish gray drilling fluid.
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)	SM	24.1			S-8, SPT 4+6+5		23.5 - 28.5 ft: gray drilling fluid

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-350** Contract Number: 06120048 Sheet: 2 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SM						23.5 - 28.5 ft: gray drilling fluid *(continued)*
28.0	28.0 - 32.0 ft: SILTY SAND; wet, dark gray, contains mica, no HCl reaction	SM	18.6		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
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	SP-SM	14.6		35	S-10, SPT 50/5" REC=5", 100%		
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		40	S-11, SPT 4+5+6		36.5 ft: decreased drilling resistance 38.5 - 43.5 ft: Uniform drilling resistance, smooth drilling
	43.5 ft: Changes to estimated 5 - 10% shell fragments, coarse to medium sand size moderately weathered shells, weak HCl reaction (with shells and soil)				45	S-12, SPT 5+5+8 REC=16", 89%		
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%		
58.0	58.0 - 63.0 ft: CLAYEY SAND WITH	SC	-11.4					58.0 ft: increased

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-350** Contract Number: 06120048 Sheet: 3 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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)	SC			60	S-15, SPT 48+50/5" REC=11", 100%		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", 100%		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 68.5 - 73.5 ft: uniform drilling resistance, smooth drilling
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%		73.5 - 98.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
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)	SP-SM	-30.4		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		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)				90	S-21, SPT 7+11+12 REC=18", 100%		
92.0		SP-SM	-45.4					

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-350** Contract Number: 06120048 Sheet: 4 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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			95	S-22, SPT 9+9+16 REC=18", 100%		73.5 - 98.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid *(continued)*
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)	SM	-50.4		100	S-23, SPT 7+10+13 REC=18", 100%		
100.0			-53.4					

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

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-351** Contract Number: 06120048 Sheet: 1 of 4

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

North: 217072.1 ft **East:** 960538.3 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 70.1 (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	SAMPLING DATA	TESTS	REMARKS
0.5	0.0 - 0.5 ft: Rootmat and topsoil		69.6			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
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	68.6			S-2, SPT 4+10+13 REC=18", 100%		
	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 5.0 ft: Changes to fine to medium grained sand; estimated <5% fine gravel, subrounded fine gravel	SM			5	S-3, SPT 2+4+3 REC=13", 72%		5.0 - 7.5 ft: pilot bit used to clear auger plug
7.5	6.0 ft: Changes to light gray		62.6					
8.0	6.1 ft: Changes to orangish brown	CL	62.1			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
9.0	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	61.1		10	S-5, SPT 3+3+4 REC=18", 100%		
	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						10.0 - 12.5 ft: Increased drilling resistance with depth, dark gray cuttings
12.5			57.6			S-6, SPT 2+4+4 REC=18", 100%		12.5 - 14.5 ft: Uniform drilling resistance
15.0	9.0 - 12.5 ft: LEAN CLAY; moist, dark gray, estimated <5% fine grained sand, no HCl reaction, firm		55.1		15	S-7, SPT 2+2+3 REC=17", 94%		14.5 - 15.0 ft: Switched to 3-1/2" tricone roller bit (mud rotary) and advanced to 100 ft, uniform drilling resistance, smooth drilling, dark gray drilling fluid
	12.5 - 15.0 ft: SANDY LEAN CLAY, fine grained sand; moist, dark gray, contains mica, no HCl reaction, firm	CL						
18.5	15.0 - 18.5 ft: LEAN CLAY WITH SAND, fine grained sand; moist, dark gray, contains mica, no HCl reaction, firm		51.6			S-8, SPT 3+4+6 REC=18", 100%		15.0 - 18.5 ft: light gray drilling fluid
	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			20	S-9, SPT 6+8+10 REC=18", 100%		

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-351** Contract Number: 06120048 Sheet: 2 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		CL						23.5 - 28.5 ft: Uniform drilling resistance, smooth drilling, light gray drilling fluid *(continued)*
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	41.6		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, fine to medium grained sand; moist, dark gray, estimated <5% shell fragments, weak HCl reaction (with shells)	SM	37.1		35	S-11, SPT 28+50/5" REC=12", 67%		33.5 - 48.5 ft: Uniform drilling resistance, smooth drilling, dark gray drilling fluid
					40	S-12, SPT 50/5" REC=5", 100%		
	43.5 ft: Changes to estimated 15 - 25% shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)				45	S-13, SPT 15+15+19 REC=14", 78%		
	48.5 ft: Changes to estimated <5% shell fragments				50	S-14, SPT 3+5+22 REC=18", 100%		48.5 - 53.5 ft: Increased drilling resistance at 51.0 ft, smooth drilling, dark gray drilling fluid
	53.5 ft: Changes to estimated 15 - 25% shell fragments, weak to moderate cementation (fine sands and shells)				55	S-15, SPT 6+23+10 REC=18", 100%		53.5 - 58.5 ft: Bit chatter from 56.5 to 57.0 ft (possible shell fragments/cemented sand), dark gray drilling fluid

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-351** Contract Number: 06120048 Sheet: 3 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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 - 78.5 ft: Uniform drilling resistance, smooth drilling, dark gray drilling fluid *(continued)*
	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%		
					70	S-18, SPT 7+7+10 REC=18", 100%		
	73.5 ft: Changes to no HCl reaction	SM			75	S-19, SPT 5+7+11 REC=18", 100%		
	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

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-351** Contract Number: 06120048 Sheet: 4 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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)	SM			95	S-23, SPT 9+14+18 REC=18", 100%		
98.5	98.5 - 100.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand; wet, gray, no HCl reaction	SP-SM	-28.4		100	S-24, SPT 10+11+18 REC=18", 100%		
100.0			-29.9					

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

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-352** Contract Number: 06120048 Sheet: 1 of 16

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

North: 216829.4 ft **East:** 960893.9 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 109.3 (ft) **Total Depth:** 200.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	7/21	4:10 PM	18.5'	14.0'	---
Start of Day	7/22	8:30 AM	9.0'	14.0'	---
Start of Day	7/23	7:00 AM	15.5'	14.0'	---
Completion	7/23	5:30 PM	12.5'	14.0'	---
Start of Day	7/24	7:30 AM	37.0'	14.0'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	0.0 - 2.0 ft: FILL, sampled as silty sand, fine to medium grained sand; moist, orangish brown, estimated <5% roots, contains mica, no HCl reaction	FILL				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
2.0	2.0 - 3.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand; moist, orangish brown, contains mica, no HCl reaction	SP-SM	107.3			S-2, SPT 2+1+2 REC=16", 89%		2.5 - 3.5 ft: Jar labeled as S-2A
3.5	3.5 - 4.5 ft: POORLY GRADED SAND, fine grained sand; moist, yellowish brown, estimated <5% silt, no HCl reaction	SP	105.8					3.5 - 4.0 ft: Jar labeled as S-2B
4.5	4.5 - 7.0 ft: 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	104.8		5	S-3, SPT 4+5+7 REC=15", 83%		5.0 - 7.5 ft: Harder drilling near the bottom of the run
7.0	7.0 - 10.8 ft: 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	102.3			S-4, SPT 12+16+21 REC=13.5", 75%		7.5 - 10.0 ft: Hard drilling (possible sand), orangish brown and yellowish brown cuttings

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-352** Contract Number: 06120048 Sheet: 2 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	10.0 ft: Changes to gray and yellowish brown, estimated <5% silt, estimated <5% coarse gravel, no HCl reaction, subrounded to rounded gravel	SP				S-5, SPT 14+17+13 REC=16", 89%		10.0 - 10.8 ft: Jar labeled as S-5A 10.0 - 13.5 ft: Uniform drilling resistance, hard drilling 10.8 - 11.5 ft: Jar labeled as S-5B
10.8	10.8 - 17.0 ft: 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	98.5					
	13.5 ft: Changes to coarse grained sand, subrounded particles; orangish brown, medium to coarse sand from 14.1 to 14.4 ft					S-6, SPT 7+6+6 REC=18", 100%		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
					15			
17.0	17.0 - 22.0 ft: 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	92.3			S-7, SPT 8+8+6 REC=10", 56%		18.5 ft: Poorly graded sand with silt cuttings
					20			
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	87.3					

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-352** Contract Number: 06120048 Sheet: 3 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
						S-8, SPT 6+7+9 REC=10", 56%		23.5 ft: smooth drilling, brown drilling fluid
		SP-SM			25			
27.0	27.0 - 37.0 ft: CLAYEY SAND, fine to medium grained sand; wet, orangish brown, contains mica, no HCl reaction		82.3					
						S-9, SPT 3+3+3 REC=16", 89%		28.5 ft: Softer drilling, orangish brown and brown cuttings, clayey sand cuttings
					30			
	32.0 ft: Changes to fine grained sand; orangish brown and brown, no mica	SC						
						S-10, SPT 1+1/12" REC=15", 83%		33.5 - 38.5 ft: easy drilling, slightly harder drilling at 37 ft
					35			

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-352** Contract Number: 06120048 Sheet: 4 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
37.0	37.0 - 47.5 ft: SANDY LEAN CLAY, fine grained sand; moist, gray, contains mica, no HCl reaction, very soft, homogenous structure		72.3					33.5 - 38.5 ft: easy drilling, slightly harder drilling at 37 ft *(continued)*
						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
					40			
		CL						
	43.5 ft: Changes to gray and light gray					S-12, SPT 1+3+3 REC=18", 100%		43.5 - 48.5 ft: brown and gray drilling fluid, fine sandy clay cuttings
					45			
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		61.8					
						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
		CL			50			48.5 ft: smooth drilling, brown

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-352** Contract Number: 06120048 Sheet: 5 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		CL						drilling fluid
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		56.8					
						S-14, SPT 4+5+7 REC=18", 100%		53.5 - 58.5 ft: slightly harder drilling, light gray drilling fluid
					55			
		CL						
	59.0 ft: Changes to 0.5 inch layer of silty sand, fine sand particles, wet, gray, no HCl reaction					S-15, SPT 5+7+9 REC=18", 100%		58.5 - 61.0 ft: easy drilling, light gray drilling fluid, lean clay cuttings
					60			
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		48.8					
						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						
						S-17, SPT 7+9+15		

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-352** Contract Number: 06120048 Sheet: 6 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		CL				REC=18", 100%		63.5 - 66.0 ft: easy drilling, light gray drilling fluid *(continued)*
					65			
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	43.8			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	41.3			S-19, SPT 50/3" REC=3", 100%		68.5 - 71.0 ft: hard drilling, uniform drilling resistance
					70			
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, weak HCl reation (with shells), no HCl reaction (with soil), soft at 71.0 ft		38.8			S-20, SPT 31+50/6" REC=9", 75%		71.0 - 73.5 ft: slightly easier drilling, light gray drilling fluid
	73.5 ft: Changes to gray and light gray, homogenous structure, weak HCl reaction (with shells and soil)	SP-SM				S-21, SPT 50/5" REC=5", 100%		73.5 - 76.0 ft: smooth drilling
					75			
						S-22, SPT 50/4" REC=4", 100%		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-352** Contract Number: 06120048 Sheet: 7 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP-SM						
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)		31.3			S-23, SPT 16+13+17 REC=13", 72%		78.5 - 81.0 ft: hard drilling, gray drilling fluid
					80			
	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)	SM				S-24, SPT 12+14+16 REC=15", 83%		81.0 - 83.5 ft: harder drilling, (possible shells and cemented sands)
	83.5 ft: Changes to weak HCl reaction (with shells and soil)					S-25, SPT 5+2+7 REC=18", 100%		83.5 - 85.0 ft: Jar labeled as S-25A
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	24.8		85			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	23.8			S-26, SPT 34+50/4" REC=8", 80%		85.5 ft: very hard drilling (possible cemented sands) 87.0 ft: hard drilling, slight rig chatter (possible cemented sand)
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	21.3			S-27, SPT 5+50/6" REC=12", 100%		88.0 ft: softer drilling 89.0 ft: slight rig chatter (possible cemented sand), light gray drilling fluid
					90			

(continued)

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-352** Contract Number: 06120048 Sheet: 8 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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				S-28, SPT 12+17+19 REC=18", 100%		92.5 ft: harder drilling (possible shells)
93.0	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		16.3			S-29, SPT 7+6+7 REC=18", 100%		93.5 - 96.0 ft: uniform drilling resistance, smooth drilling
					95			
	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-30, SPT 5+9+14 REC=16", 89%		
	98.5 ft: Changes to fine sand to fine gravel size fresh to highly weathered shells					S-31, SPT 5+5+7 REC=18", 100%		98.5 - 101.0 ft: gray and light gray drilling fluid
					100			
100.5	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)		8.8			S-32, SPT 4+5+7 REC=18", 100%		
		SM						
	103.5 ft: Changes to gray and light gray, fresh to highly weathered shells					S-33, SPT 5+6+8 REC=18", 100%		

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-352** Contract Number: 06120048 Sheet: 9 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SM			105			
105.5	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	3.8			S-34, SPT 3+3+4 REC=18", 100%		
108.0	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	1.3		110	S-35, SPT 3+4+6 REC=18", 100%		108.5 ft: light gray drilling fluid
110.5	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	-1.2			S-36, SPT 3+5+6 REC=18", 100%		
113.0	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)	ML	-3.7		115	S-37, SPT 6+19+14 REC=18", 100%		114.0 ft: slight rig chatter (possible shells)
115.5	115.5 - 118.0 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	-6.2			S-38, SPT 7+8+8 REC=18", 100%		115.5 ft: heavy rig chatter (possible cemented sand) 116.0 - 118.5 ft: uniform drilling resistance, smooth drilling

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-352** Contract Number: 06120048 Sheet: 10 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
118.0	118.0 - 120.5 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	-8.7		120	S-39, SPT 40+19+27 REC=18", 100%		118.5 - 121.0 ft: slightly harder drilling, gray drilling fluid
120.5	120.5 - 128.0 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)	SM	-11.2			S-40, SPT 8+12+10 REC=18", 100%		121.0 - 123.5 ft: smooth drilling
	123.5 ft: Changes to fine grained sand; estimated <5% 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				125	S-41, SPT 7+7+11 REC=17", 94%		123.5 - 126.0 ft: easy drilling
	126.0 ft: Changes to homogenous structure, fine sand size highly weathered shells					S-42, SPT 5+8+12 REC=18", 100%		126.0 - 128.5 ft: smooth drilling
128.0	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)	ML	-18.7		130	S-43, SPT 7+9+10 REC=18", 100%		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-352** Contract Number: 06120048 Sheet: 11 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	133.5 ft: Changes to firm, shells decrease with depth					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			
								137.0 ft: harder drilling
		ML						
	138.5 ft: Changes to hard, homogenous structure, fine sand size highly weathered shells, no HCl reaction (with shells or soil)					S-45, SPT 6+7+8 REC=18", 100%		138.5 - 143.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
					140			
	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)					S-46, SPT 5+6+9 REC=18", 100%		143.5 - 148.5 ft: silt and fine sand cuttings

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-352** Contract Number: 06120048 Sheet: 12 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		ML			145			143.5 - 148.5 ft: silt and fine sand cuttings *(continued)*
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	-37.7			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	-42.7			S-48, SPT 4+5+8 REC=18", 100%		153.5 - 158.5 ft: easy drilling
					155			

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-352** Contract Number: 06120048 Sheet: 13 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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 shells					S-50, SPT 5+6+7 REC=18", 100%		163.5 - 168.5 ft: easy drilling
		ML			165			
								168.0 - 173.5 ft: smooth drilling
	168.5 ft: Changes to fine sand size highly weathered shells					S-51, SPT 4+5+7 REC=18", 100%		
					170			

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-352** Contract Number: 06120048 Sheet: 14 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		ML						168.0 - 173.5 ft: smooth drilling *(continued)*
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		-63.2					
						S-52, SPT 5+6+7 REC=18", 100%		173.5 - 178.5 ft: soft drilling, olive gray and gray drilling fluid
					175			
		ML						
						S-53, SPT 5+6+9 REC=18", 100%		178.5 - 183.5 ft: fine sand in cuttings 179.0 ft: harder drilling
					180			180.0 ft: softer drilling
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)		-72.7					
		ML				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
					185			

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-352** Contract Number: 06120048 Sheet: 15 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
								183.5 - 188.5 ft: uniform drilling resistance, smooth drilling, olive gray and gray drilling fluid *(continued)*
						S-55, SPT 5+6+9 REC=18", 100%		188.5 - 193.5 ft: olive gray drilling fluid
					190			
		ML						
	193.5 ft: Changes to hard					S-56, SPT 6+9+10 REC=18", 100%		193.5 - 198.5 ft: easy drilling
					195			
						S-57, SPT		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-352** Contract Number: 06120048 Sheet: 16 of 16

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
200.0		ML	-90.7		200	6+6+10 REC=18", 100%		

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

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-353** Contract Number: 06120048 Sheet: 1 of 7

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

North: 216772.7 ft **East:** 960972.2 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'	---
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	SAMPLING 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
	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				S-1, SPT 1+3+3 REC=13", 72%		
2.0	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	108.9			S-2, SPT 1+2+2 REC=12", 67%		
4.5	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	106.4		5	S-3, SPT 4+4+2 REC=15", 83%		5.0 - 7.5 ft: orangish brown cuttings
7.0	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	103.9			S-4, SPT 4+6+6 REC=16", 89%		7.5 - 10.0 ft: orangish brown and brown cuttings
					10	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
					15			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
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 to subrounded coarse sand at 18.5 ft	SP-SM	93.9			S-7, SPT 10+17+18 REC=15", 83%		
					20			21.0 - 21.5 ft: orangish brown drilling fluid
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			S-8, SPT 4+6+5 REC=11", 61%		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-353** Contract Number: 06120048 Sheet: 2 of 7

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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%		23.5 - 28.5 ft: slightly harder driling, uniform drillling resistance *(continued)* 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 45	S-11, SPT 2+2+3 REC=19", 106% 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
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		55	S-14, SPT 3+4+4 REC=17", 94%		53.5 - 58.5 ft: smooth driling
57.0	57.0 - 61.0 ft: LEAN CLAY; moist, gray, estimated <5% fine grained sand, no HCl reaction, hard, homogenous structure,	CL	53.9					

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-353** Contract Number: 06120048 Sheet: 3 of 7

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	contains 0.5 inch layer of sandy lean clay at 59.5 ft	CL			60	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 *(continued)*
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				65	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%		
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%		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				70	S-20, SPT 50/4" REC=4", 100%		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			S-21, SPT 50/6" REC=4", 67%		73.5 - 76.0 ft: fine sands gray in color, est < 5% fine shells (moderately weathered)
	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)				75	S-22, SPT 50/3" REC=3", 100%		
	78.5 ft: Changes to fresh to highly weathered shell fragments, weak HCl reaction (with shells), no HCl (with soil)					S-23, SPT 50/4" REC=4", 100%		78.5 - 81.0 ft: Driller De-sanded mud tub
	81.0 ft: Changes to highly weathered shells, weak to moderate cementation				80	S-24, SPT 50/5" REC=4", 80%		
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	SM	27.9			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				85	S-26, SPT 3+50/3" REC=6", 67%		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", 100%		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	SM	20.9		90	S-28, SPT 67/6" REC=5", 83%		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-353** Contract Number: 06120048 Sheet: 4 of 7

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
93.0	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	17.9					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 - 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)	SM			95	S-29, SPT 9+11+11 REC=17", 94%		91.0 - 93.5 ft: slight rig chatter at 93 ft (possible cemented sand) *(continued)*
	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					S-30, SPT 5+8+10 REC=18", 100%		
	98.5 ft: Changes to gray and light gray, weak HCl Reaction (with soil and shells)				100	S-31, SPT 8+10+10 REC=18", 100%		93.5 - 96.0 ft: Unifom resistance, easy drilling, drilling marsh funnel test performed, 43 sec drilling fluid
	101.0 ft: Changes to gray, estimated <5% shell fragments					S-32, SPT 7+9+14 REC=16", 89%		
	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%		96.0 - 98.5 ft: easy drilling, gray drilling fluid
	105.5 ft: Changes to fine to medium sand size shell fragments, highly weathered, no HCl reaction (with shells), no HCl reaction (with soil)					S-34, SPT 5+5+7 REC=17", 94%		98.5 - 101.0 ft: harder drilling, driller used 100 gallons of drilling fluid, added 1/2 bag of bentonite to drilling
	108.0 ft: Changes to contains mica					S-35, SPT 3+15+5 REC=17", 94%		101.0 - 103.5 ft: easy drilling
					110			103.5 - 106.0 ft: smooth drilling
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			S-36, SPT 3+3+5 REC=18", 100%		106.0 - 108.5 ft: gray and olive gray 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			S-37, SPT 8+10+26 REC=14", 78%		108.5 - 110.0 ft: gray drilling fluid, marsh funnel test performed (45 sec drilling fluid)
					115	S-38, SPT 14+15+17 REC=17", 94%		115.0 ft: rig chatter (possible cemented shells), 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			S-39, SPT 7+17+39 REC=17", 94%		116.5 ft: rig chatter (possible cemented sand), hard drilling
					120			118.5 - 121.0 ft: Rig chatter throughout (possible cemented sands)
						S-40, SPT 10+11+17 REC=18", 100%		121.0 - 123.5 ft: smooth drilling, light gray drilling fluid
	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.							
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	SM	-12.1			S-41, SPT 12+13+13 REC=17", 94%		123.5 - 126.0 ft: gray drilling fluid
					125			

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-353** Contract Number: 06120048 Sheet: 5 of 7

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	gray at 124.5 ft, weak HCl reaction (with shells and soil), shells decrease with with depth. 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 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 133.5 ft: Changes to fine sand size highly weathered shells, weak HCl reaction (with shells), no HCl reaction (with soil)	SM			130 135	S-42, SPT 6+6+12 REC=18", 100% S-43, SPT 4+9+15 REC=18", 100% S-44, SPT 4+9+10 REC=18", 100%		126.0 - 128.5 ft: gray and and dark gray drilling fluid *(continued)* 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 - 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 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 148.5 ft: Changes to fine sand to fine gravel size angular shell fragments 153.5 ft: Changes to fine to medium sand size moderately to highly weathered shell fragments, weak HCl reaction (with shells and soil), soft to firm 158.5 ft: Changes to highly weathered shell fragments, firm to hard	ML	-26.1		140 145 150 155	S-45, SPT 6+9+11 REC=18", 100% S-46, SPT 4+7+8 REC=18", 100% S-47, SPT 4+5+6 REC=18", 100% S-48, SPT 5+7+9 REC=18", 100% S-49, SPT 4+6+7 REC=18", 100%		138.5 - 143.5 ft: slightly faster drilling at 142 ft 146.5 ft: harder drilling (possible sand) gray and greenish gray drilling fluid 148.5 - 153.5 ft: Uniform drilling resistance, easy drilling, gray drilling fluid 153.5 - 158.5 ft: smooth drilling, olive gray drilling fluid

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-353** Contract Number: 06120048 Sheet: 6 of 7

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	163.5 ft: Changes to fine sand size shells	ML			165	S-50, SPT 6+7+9 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 *(continued)* 163.5 - 168.5 ft: greenish gray and olive gray drilling fluid
	168.5 ft: Changes to highly weathered shells				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		-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
	183.5 ft: Changes to homogenous structure	ML			185	S-54, SPT 5+7+9 REC=16", 89%		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

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-353** Contract Number: 06120048 Sheet: 7 of 7

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		ML			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 *(continued)*
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					
200.0			-89.1		200	S-57, SPT 6+8+9 REC=17", 94%		

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

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-354** Contract Number: 06120048 Sheet: 1 of 8

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

North: 217131.1 ft **East:** 961098.9 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 92.4 (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	SAMPLING DATA	TESTS	REMARKS
0.3	0.0 - 0.3 ft: Topsoil		92.1					0.0 ft: advanced 6 1/4" ID HSA to 18.5 ft; 0 to 1.5 ft interval uniform drilling resistance
	0.3 - 2.9 ft: SILTY SAND, fine grained sand; moist, orangish brown, estimated <5% organics, organic odor, no HCl reaction	SM				S-1, SPT 2+2+4 REC=13", 72%		
2.9	2.5 ft: Changes to no organics, no odor		89.5			S-2, SPT 3+4+3 REC=14", 78%		2.5 - 2.9 ft: jar labeled as S-2A
	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						2.9 - 4.0 ft: jar labeled as S-2B
4.5		SW-SM	87.9		5	S-3, SPT 4+4+5 REC=16", 89%		5.0 - 7.5 ft: smooth drilling, orangish brown cuttings
7.0	4.5 - 7.0 ft: WELL GRADED SAND WITH SILT, fine to coarse grained sand, subrounded particles; moist, orangish brown, no HCl reaction		85.4					
	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				S-4, SPT 3+4+4 REC=18", 100%		
9.5			82.9		10	S-5, SPT 3+5+6 REC=14", 78%		
	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						
12.0			80.4			S-6, SPT 4+8+9 REC=16", 89%		
	12.0 - 14.5 ft: CLAYEY SAND WITH GRAVEL, fine to coarse grained sand, subrounded particles; moist, orangish brown, no HCl reaction	SC						
14.5			77.9		15	S-7, SPT 4+9+11 REC=17", 94%		15.0 - 16.5 ft: hammer energy test performed
	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						
17.5			74.9					
	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 white clay at 19.6 and 19.8 ft	SP-SM			20	S-8, SPT 1+2+3 REC=14", 78%		18.5 ft: switched to 3 1/4" OD tricone roller bit (mud rotary) and advanced to 196.5 ft; 18.5 to 23.5 ft interval, brown drilling fluid
22.0			70.4					
	22.0 - 24.2 ft: POORLY GRADED SAND WITH GRAVEL, fine to medium grained sand, subangular particles; wet, orangish brown, (subrounded fine gravel)	SP						
24.2			68.2			S-9, SPT 23+13+4 REC=17", 94%		23.5 - 24.2 ft: jar labeled as S-9A
24.6	24.2 - 24.6 ft: FAT CLAY; moist, light	CH	67.8					

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-354** Contract Number: 06120048 Sheet: 2 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	brown, estimated 5 - 10% fine and coarse sand, very hard							23.7 - 24.2 ft: roller bit grinding, gray drilling fluid
	24.6 - 28.0 ft: SILTY SAND, fine to medium grained sand; moist, dark orangish brown	SM						24.2 - 24.6 ft: jar labeled as S-9B
28.0	28.0 - 42.0 ft: LEAN CLAY; moist, grayish brown, estimated <5% sand, contains mica, no HCl reaction, soft	CL	64.4		30	S-10, SPT 3+3+5 REC=18", 100%		28.5 - 33.5 ft: hammer energy test performed; little drilling resistance
					35	S-11, SPT 3+5+5 REC=18", 100%		33.5 - 35.0 ft: hammer energy test performed 35.0 ft: clay reducer added 36.0 ft: increased drilling resistance 37.5 ft: drilling resistance decreased
	38.5 ft: Changes to firm				40	S-12, SPT 3+4+7 REC=18", 100% S-13, SPT 5+7+9 REC=18", 100%		38.5 - 40.0 ft: uniform drilling resistance
42.0	42.0 - 44.5 ft: SANDY LEAN CLAY; moist, grayish brown, hard, clayey sand layer between 42.8 and 43 ft	CL	50.4			S-14, SPT 10+8+11 REC=18", 100%		
44.5	44.5 - 47.0 ft: SANDY LEAN CLAY; moist, grayish brown, no HCl reaction, soft	CL	47.9		45	S-15, SPT 6+7+8 REC=12", 67%		45.0 - 46.5 ft: hammer energy test performed
47.0	47.0 - 50.8 ft: CLAYEY SAND; moist, grayish brown, contains mica, no HCl reaction	SC	45.4			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	41.6		50	S-17, SPT 8+9+21 REC=16", 89%		50.0 - 50.8 ft: jar labeled as S-17A 50.8 - 51.5 ft: jar labeled as S-17B
52.0	52.0 - 54.5 ft: SILTY SAND, fine to coarse grained sand; moist, orangish brown, contains mica, no HCl reaction 53.6 ft: Changes to strong HCl reaction (with shells) at thin white seashell layer	SM	40.4			S-18, SPT 14+50/3" REC=9", 100%		51.0 ft: harder material encountered 52.5 - 55.0 ft: rig chatter at 53 ft, hard drilling throughout interval
54.5	54.5 - 57.0 ft: POORLY GRADED SAND, fine to medium grained sand; moist, light brown, no HCl reaction	SP	37.9		55	S-19, SPT 50/3" REC=1", 33%		55.0 - 57.5 ft: hard resistance drilling
57.0	57.0 - 59.5 ft: SILTY SAND, fine grained	SM	35.4			S-20, SPT 50/5" REC=5", 100%		

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-354** Contract Number: 06120048 Sheet: 3 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	sand; moist, light brown, contains mica	SM						
59.5	59.5 - 64.5 ft: CLAYEY SAND, fine grained sand; wet, orangish brown, contains mica	SC	32.9		60	S-21, SPT 50/5" REC=5", 100%		61.0 ft: decreased drilling resistance
	62.5 ft: Changes to contains shells, strong HCl reaction (with shells)					S-22, SPT 3+11+25 REC=12", 67%		62.5 - 65.0 ft: moderately hard drilling resistance
64.5	64.5 - 67.0 ft: SILTY SAND, fine grained sand; wet, grayish brown, contains mica, contains shell fragments, weak HCl reaction (with shells)	SM	27.9		65	S-23, SPT 50/6" REC=6", 100%		65.0 - 67.5 ft: hard drilling resistance
67.0	67.0 - 68.3 ft: CLAYEY SAND, fine grained sand; moist, light brownish gray, estimated 5 - 10% shells, weak HCl reaction	SC	25.4			S-24, SPT 3+4+20 REC=18", 100%		67.5 - 68.3 ft: jar labeled as S-24A
68.3	68.3 - 74.5 ft: SILTY SAND, fine grained sand; moist, brownish gray, weak HCl reaction	SM	24.1		70	S-25, SPT 4+11+9 REC=18", 100%		68.3 - 69.0 ft: jar labeled as S-24B 69.3 ft: extremely hard with considerable drilling resistance 69.8 ft: broke through hard material
	73.3 ft: Changes to estimated 5 - 10% shells					S-26, SPT 40+7+9 REC=18", 100%		72.0 ft: hard drilling resistance
74.5	74.5 - 92.0 ft: SILTY SAND, fine grained sand; wet, brownish gray, estimated 15 - 25% shell fragments, weak HCl reaction	SM	17.9		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					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
92.0		SP-SM	0.4					

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-354** Contract Number: 06120048 Sheet: 4 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	92.0 - 97.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand; wet, brownish gray, no HCl reaction	SP-SM				S-34, SPT 3+3+4 REC=18", 100%		test 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%		
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	-4.6			S-36, SPT 15+20+20 REC=18", 100%		92.5 - 95.0 ft: uniform drilling resistance, brownish gray drilling fluid
99.5	99.5 - 109.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand; moist, gray, estimated 15 - 25% shell fragments, weak HCl reaction (with shells)	SP-SM	-7.1		100	S-37, SPT 27+16+17 REC=18", 100%		99.5 - 100.0 ft: some drilling resistance, light rod chatter
	102.5 ft: Changes to gray and white, estimated 5 - 10% shell fragments, (white shell fragments)					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)				105	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	SP-SM	-17.1		110	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%		
					115			
	118.5 ft: Changes to no HCl reaction					S-43, SPT 5+6+11 REC=18", 100%		118.5 - 120.0 ft: hammer energy test performed
					120			
	123.5 ft: Changes to no shell fragments					S-44, SPT 5+6+8 REC=18", 100%		
					125			

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-354** Contract Number: 06120048 Sheet: 5 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
127.0	127.0 - 142.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand; 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	SP-SM	-34.6		130	S-45, SPT 5+6+10 REC=18", 100%		
	133.5 ft: Changes to estimated 5 - 10% shell fragments, (white shell fragments)	SP-SM			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	CL	-50.1		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	CL	-60.1		155	S-50, SPT 4+5+7 REC=18", 100%		153.5 - 158.0 ft: uniform drilling resistance, light gray drilling fluid
	154.8 ft: Changes to wet							
	158.5 ft: Changes to moist, weak HCl reaction, firm					S-51, SPT 4+5+7 REC=18", 100%		

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-354** Contract Number: 06120048 Sheet: 6 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		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		-74.6		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
182.0	182.0 - 196.5 ft: LEAN CLAY; moist, brownish gray, no HCl reaction, firm		-89.6		185	S-56, SPT 7+9+10 REC=18", 100%		
	188.5 ft: Changes to homogenous structure	CL			190	S-57, SPT 6+8+11 REC=18", 100%		

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-354** Contract Number: 06120048 Sheet: 7 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		CL			195	S-58, SPT 6+7+10 REC=18", 100%		193.5 - 196.5 ft: performed hammer energy test *(continued)*
196.5	196.5 - 199.3 ft: SILTY SAND, fine grained sand; moist, brownish gray, weak HCl reaction	SM	-104.1			UD-1, UNDIST REC=10", 100% 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 PP = 4.50 tsf	196.5 ft: attempted to lower shelby tube for sampling; could not lower shelby tube past 110 ft; switched to 6"OD tricone roller bit and advanced to 195.5 ft, reamed hole to 196.5 ft: shelby tube attempt at 196.5 ft, soil too hard, pushed 10"; 10" recovery, drillers unable to shear soil for shelby tube, sample placed in jar and labeled UD-1
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	-106.9		200	S-59, SPT 5+7+18 REC=8", 44%		
203.0	203.0 - 208.0 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	-110.6		205	S-60, SPT 7+17+24 REC=18", 100% UD-3, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 3.50 tsf PP = 4.50 tsf	197.3 - 199.3 ft: advanced pitcher tube sampler, pushed 24"
208.0	208.0 - 212.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand; 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	-115.6		210	S-61, SPT 7+12+24 REC=18", 100%		199.3 ft: switched to 3 1/4" OD tricone roller bit, uniform drilling resistance 203.5 - 206.5 ft: 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	-120.1		215	S-62, SPT 5+8+13 REC=18", 100% UD-4, UNDIST REC=24", 100%	PP = 3.50 tsf PP = 2.50 tsf PP = 3.00 tsf	206.5 - 208.5 ft: pitcher tube 208.5 - 213.5 ft: switched to 3 1/4" tricone roller bit and advanced to 213.5 ft 213.5 - 215.0 ft: hammer energy test performed
					220	S-63, SPT 6+13+23 REC=16", 89%		213.5 - 216.5 ft: switched to 6" tricone roller bit and reamed hole from 208.5 to 216.5 ft 216.5 ft: pushed pitcher sampler 24", waited 30 minutes, 24" recovery
					225	S-64, SPT 5+6+10 REC=16", 89% UD-5, UNDIST	PP = 4.50 tsf	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

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-354** Contract Number: 06120048 Sheet: 8 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP-SM				REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf	drilling resistance, gray drilling fluid, contains fine gravel size cuttings
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	-136.1		230	S-65, SPT 6+9+13 REC=18", 100%		223.5 - 225.0 ft: hammer energy test performed 223.5 - 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: pitcher sampler *(continued)*
	233.5 ft: Changes to no shells, no HCl reaction				235	S-66, SPT 7+11+13 REC=18", 100%		
						UD-6, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	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
238.5	238.5 - 248.5 ft: SILTY SAND, fine grained sand; moist, brownish gray, contains mica, no HCl reaction		-146.1		240	S-67, SPT 6+9+15 REC=18", 100%		233.5 - 236.5 ft: switched to 6" OD tricone roller bit; hole reamed fom 228.5 to 236.5; uniform drilling resistance
					245	S-68, SPT 6+9+13 REC=18", 88%		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
						UD-7, UNDIST REC=19", 79%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	
248.5	248.5 - 251.5 ft: POORLY GRADED SAND WITH CLAY, fine grained sand; moist, brownish gray, no HCl reaction	SP-SC	-156.1		250	S-69, SPT 6+11+15 REC=14", 78%		238.5 - 240.0 ft: hammer energy test performed 238.5 - 243.5 ft: switched to 3 1/4" OD tricone roller bit and advanced to 243.5 ft 246.5 - 248.5 ft: pushed pitcher sampler 24", 19" recovery 250.0 - 251.5 ft: hammer energy test performed
251.5			-159.1					

Bottom of Boring at 251.5 ft.
Boring backfilled with cement/bentonite grout upon completion.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-355** Contract Number: 06120048 Sheet: 1 of 8

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

North: 217052.6 ft **East:** 960993.5 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	SAMPLING 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 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 2.5 ft: Changes to medium to coarse grained sand; no roots	SM				S-2, SPT 2+4+5 REC=14", 78%		
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%		
		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		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 advanced to 38.5 ft 18.5 - 23.5 ft: uniform drilling resistance, orangish brown drilling fluid, used Easy Seal as drilling fluid
		SP-SM			20			
23.0	23.0 - 42.0 ft: LEAN CLAY WITH SAND, fine grained sand; moist, gray, no HCl reaction, soft	CL	65.2			S-9, SPT 3+4+5 REC=18", 100%		

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-355** Contract Number: 06120048 Sheet: 2 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
						S-10, SPT 2+3+4 REC=18", 100%		28.5 - 33.5 ft: light brown drilling fluid
					30			
	33.5 ft: Changes to firm	CL				S-11, SPT 3+4+7 REC=18", 100%		
					35			
	38.5 ft: Changes to hard					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
	40.0 ft: Changes to soft				40	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%		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
					45	S-15, SPT 5+8+11 REC=18", 100%		
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	SP-SM	38.7		50	S-17, SPT 50/5" REC=5", 100%		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", 100%		
	57.5 ft: Changes to contains shell fragments, no HCl reaction					S-20, SPT 50/3" REC=3", 100%		

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-355** Contract Number: 06120048 Sheet: 3 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	60.0 ft: Changes to fine to medium grained sand	SP-SM			60	S-21, SPT 50/5" REC=5", 100%		
	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", 100%		65.5 ft: drilling extremely hard and slow, considerable drilling resistance 67.5 ft: extremely hard and slow drilling
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%		
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", 100%		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 (with soil)	SM	16.2			S-26, SPT 14+12+9 REC=18", 100%		72.5 - 75.0 ft: moderatly uniform drilling resistance, cuttings infrequent
74.5	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	13.7		75	S-27, SPT 5+4+5 REC=14", 78%		75.0 - 95.5 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	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%		
	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		SM	-3.8					

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-355** Contract Number: 06120048 Sheet: 4 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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				S-34, SPT 4+5+8 REC=18", 100%		75.0 - 95.5 ft: uniform drilling resistance *(continued)*
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) 97.5 ft: Changes to wet, estimated 5 - 10% shell fragments	SM	-6.3		95	S-35, SPT 12+21+50/5" REC=17", 150% S-36, SPT 14+42+29 REC=18", 100%		95.5 - 97.0 ft: hard drilling, considerable drilling resistance 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 shells), no HCl reaction (with soil) 102.0 ft: Changes to contains shell fragments, no HCl reaction	SP-SM	-11.0		100	S-37, SPT 18+50/5" REC=11", 100% S-38, SPT 10+20+29 REC=18", 100%		100.0 - 123.5 ft: uniform drilling resistance, light gray drilling fluid
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) 107.5 ft: Changes to estimated 15 - 25% shell fragments	SM	-16.3		105 110	S-39, SPT 6+8+11 REC=18", 100% 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		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%		
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%		123.5 - 128.5 ft: infrequent cuttings of silty sand

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-355** Contract Number: 06120048 Sheet: 5 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		ML						123.5 - 128.5 ft: infrequent cuttings of silty sand *(continued)*
127.0	127.0 - 132.0 ft: SILTY SAND, fine grained sand; moist, gray and white, estimated 30 - 45% shell fragments, white shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	-38.8		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 - 168.5 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%		
	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		155	S-49, SPT 5+5+8 REC=18", 100%		
157.0	157.0 - 182.0 ft: SANDY SILT, fine grained sand; moist, gray, no HCl reaction, firm	ML	-68.8			S-50, SPT 5+6+9 REC=18", 100%		

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-355** Contract Number: 06120048 Sheet: 6 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
								133.5 - 168.5 ft: uniform drilling resistance, light gray drilling fluid *(continued)*
					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
182.0	182.0 - 191.0 ft: SANDY SILT, fine grained sand; moist, brownish gray, weak HCl reaction, firm		-93.8					
					185	S-55, SPT 5+7+12 REC=18", 100%		183.5 - 188.5 ft: uniform drilling resistance, light gray drilling fluid, no solid cuttings
		ML						
					190	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

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-355** Contract Number: 06120048 Sheet: 7 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SM			195	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 *(continued)*
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		200	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		-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: pitcher sampler
					205	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
		SP-SM			210	S-60, SPT 4+5+10 REC=18", 100%		208.5 - 213.5 ft: no gravel sized sand cuttings
	213.5 ft: Changes to fine grained sand; brownish gray				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		-129.8		220	S-62, SPT 5+7+12 REC=18", 100%		
		SP-SM						
224.0	224.0 - 227.5 ft: SILTY SAND, fine grained sand; moist, grayish brown, contains mica, no HCl reaction		-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
		SM						

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-355** Contract Number: 06120048 Sheet: 8 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
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 *(continued)*
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
	238.5 ft: Changes to firm				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		250	S-68, SPT 4+7+11 REC=13", 72%		
250.0			-161.8					

Bottom of Boring at 250.0 ft.
Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 1 of 19

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

North: 216965.3 ft **East:** 961264.9 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 121.0 (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	SAMPLING 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	120.5			S-1, SPT 4+3+6 REC=18", 100%		0.0 ft: advanced 6 1/4" ID HSA to 18.5 ft; 0.0 - 2.5 interval: slight chatter to 0.5 ft (possible gravel)
	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						
2.5	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	118.5			S-2, SPT 3+3+3 REC=10", 56%		2.5 ft: uniform drilling resistance
	5.4 ft: Changes to yellowish brown				5	S-3, SPT 2+2+2 REC=13", 72%		5.0 ft: soft drilling
6.0	6.0 - 7.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand; moist, yellowish brown, no HCl reaction	SP-SM	115.0					
7.0	7.0 - 10.6 ft: CLAYEY SAND, fine to medium grained sand; moist, orangish brown, contains mica, no HCl reaction	SC	114.0			S-4, SPT 3+2+3 REC=10", 56%		7.5 ft: easy drilling

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 2 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
10.6	10.6 - 12.5 ft: SANDY LEAN CLAY, fine grained sand; moist, gray and orangish brown, no HCl reaction, soft to very soft	SC CL	110.4			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	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	108.5		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	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	104.0		20	S-7, SPT 20+19+22 REC=18", 100%		18.5 ft: switched to 3 1/2" OD tricone roller bit (mud rotary drilling) and advanced to 221.5 ft; uniform drilling 19.5 ft: yellowish brown drilling fluid
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	99.0					

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 3 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		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		94.0					
		SP-SM			30	S-9, SPT 7+8+10 REC=10", 56%		28.5 ft: orangish brown drilling fluid 29.5 ft: slight rig chatter (possible gravel)
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		89.0					
		SP			35	S-10, SPT 16+17+18 REC=12", 67%		33.5 - 43.5 ft: drillers thickened drilling fluid

(continued)

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 4 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
37.0	37.0 - 42.0 ft: CLAYEY SAND, fine to medium grained sand; wet, orangish brown and gray, no HCl reaction	SC	84.0		40	S-11, SPT 2+4+6 REC=14", 78%		33.5 - 43.5 ft: drillers thickened drilling fluid *(continued)*
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	79.0		45	S-12, SPT 2+2+3 REC=17", 94%		43.5 - 45.0 ft: hammer energy test performed
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	74.0		50	S-13, SPT 3+4+4 REC=18", 100%		48.5 ft: gray drilling fluid, softer drilling

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 5 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	53.5 ft: Changes to soft	CL				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		64.0					
								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			
		CL				S-15, SPT 3+3+5 REC=18", 100%		60.5 - 62.0 ft: hammer energy test performed 60.5 ft: easy drilling
	63.5 ft: Changes to firm					S-16, SPT 3+5+5		

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 6 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
						REC=18", 100%		
					65			
		CL						
	68.5 ft: Changes to hard					S-17, SPT 3+5+7 REC=18", 100%		
					70			
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	50.5			S-18, SPT 3+5+6 REC=18", 100%		
73.0	73.0 - 75.5 ft: SANDY LEAN CLAY, fine to medium grained sand; gray and greenish gray, no HCl reaction, soft to very soft, homogenous structure	CL	48.0			S-19, SPT 4+5+5 REC=18", 100%		73.5 - 75.0 ft: hammer energy test performed
					75			
75.5	75.5 - 77.5 ft: SANDY LEAN CLAY, fine to medium grained sand; gray, no HCl reaction, hard, homogenous structure	CL	45.5			S-20, SPT 11+14+26 REC=13", 72%		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 7 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
77.5	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	43.5			S-21, SPT 17+20+50/5" REC=15", 88%		77.5 ft: harder drilling (possible shells)
80.0	80.0 - 90.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand; wet, brown and yellowish brown, no HCl reaction, homogenous structure		41.0		80			80.0 ft: rig chatter (possible shells)
						S-22, SPT 50/4" REC=4", 100%		81.5 ft: heavy rig chatter (possible cemented sand)
								82.5 ft: softer drilling
	83.5 ft: Changes to yellowish brown					S-23, SPT 50/6" REC=6", 100%		83.5 - 85.0 ft: hard drilling
		SP-SM			85			
	86.0 ft: Changes to gray and light gray					S-24, SPT 50/4" REC=4", 100%		86.0 - 88.5 ft: harder drilling
	88.5 ft: Changes to gray					S-25, SPT 50/4" REC=3", 75%		88.5 - 88.9 ft: hammer energy test performed 88.5 ft: hard drilling
90.0	90.0 - 93.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand; wet, gray, no HCl reaction, homogenous structure	SP-SM	31.0		90			

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 8 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP-SM				S-26, SPT 15+11+33 REC=13", 72%		
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	28.0			S-27, SPT 3+50/3" REC=9", 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)
					95			
	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%		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	23.0			S-29, SPT 4+8+8 REC=19", 106%		
					100			
100.5	100.5 - 101.0 ft: SANDY LEAN CLAY, fine grained sand; wet, gray and light gray, estimated <5% shell fragments, soft to firm, homogenous structure, weak HCl rection (with shells and soil)	CL	20.5					100.5 ft: hard drilling (possible shells)
101.0	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	SP-SM	20.0			S-30, SPT 50/4" REC=3", 75%		
						S-31, SPT 6+9+11 REC=16", 89%		103.5 - 105.0 ft: hammer energy test performed

(continued)

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 9 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
					105			103.5 - 105.0 ft: hammer energy test performed *(continued)*
	106.0 ft: Changes to moderately weathered shell fragments, weak HCl reaction with shells, shell content increases with depth					S-32, SPT 6+11+16 REC=17", 94%		
		SP-SM				S-33, SPT 6+7+8 REC=18", 100%		
					110			
	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		8.0			S-35, SPT 6+11+13 REC=18", 100%		
					115			
	115.5 ft: Changes to highly weathered shell fragments	SP-SM				S-36, SPT 4+6+9 REC=16", 89%		

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 10 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	118.0 ft: Changes to gray	SP-SM			120	S-37, SPT 3+3+4 REC=18", 100%		
	121.0 ft: Changes to fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil), shells increase with depth					S-38, SPT 4+4+4 REC=18", 100%		
122.0	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	-1.0			S-39, SPT 3+4+8 REC=17", 94%		123.5 - 124.0 ft: jar labeled as S-39A
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	-3.0		125			124.0 - 125.0 ft: jar labeled as S-39B
125.5	125.5 - 128.0 ft: SANDY LEAN CLAY, fine grained sand; wet, gray, estimated 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	-4.5			S-40, SPT 12+19+26 REC=18", 100%		
128.0	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	CL	-7.0			S-41, SPT 12+16+25 REC=18", 100%		128.5 - 129.2 ft: jar labeled as S-41A
129.2	129.2 - 130.5 ft: CLAYEY SAND, fine grained sand; wet, gray, estimated <5% shell fragments, strong HCl reaction	SC	-8.2		130			129.2 - 130.0 ft: jar labeled as S-41B
130.5	130.5 - 133.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand; wet, gray, estimated <5% shell fragments, weak HCl reaction,	SP-SM	-9.5			S-42, SPT 16+27+32		

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 11 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	homogenous structure, moderately weathered shell fragments, shells increase with depth	SP-SM				REC=16", 89%		131.0 - 136.0 ft: rig chatter (possible shell fragments) *(continued)*
133.0	133.0 - 135.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand; wet, gray, estimated <5% shell fragments, weak HCl reaction, homogenous structure, moderately weathered shell fragments	SP-SM	-12.0		135	S-43, SPT 5+8+13 REC=18", 100%		
135.5	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	-14.5			S-44, SPT 4+5+10 REC=18", 100%		
138.0	138.0 - 139.2 ft: SANDY LEAN CLAY, fine grained sand; wet, gray, estimated <5% shell fragments	CL	-17.0			S-45, SPT 3+5+11 REC=18", 100%		138.5 - 139.2 ft: jar labeled as S-45A
139.2	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)	SM	-18.2					139.2 - 140.0 ft: jar labeled as S-45B
140.0	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	SP-SM	-19.0		140	S-46, SPT 5+6+8 REC=18", 100%		

(continued)

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 12 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP-SM			145			
147.0	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		-26.0					
						S-47, SPT 6+6+8 REC=17", 94%		148.5 - 150.0 ft: hammer energy test performed
					150			
		SC						
	153.5 ft: Changes to homogenous structure, fresh to moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)					S-48, SPT 5+6+7 REC=18", 100%		153.5 - 158.5 ft: mixed new batch of drilling fluid
					155			
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	-36.0					

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 13 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP-SM			160	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)		-41.0					
		SP-SM			165	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)		-46.0					
		ML			170	S-51, SPT 4+6+9 REC=18", 100%		168.5 - 173.5 ft: easy (soft) drilling

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 14 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
								168.5 - 173.5 ft: easy (soft) drilling *(continued)*
								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
					175			
	175.5 ft: Changes to dark gray, estimated <5% shell fragments, weak HCl reaction, firm, moderately weathered shell fragments	ML				S-52, SPT 3+6+7 REC=16", 89%		
	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			
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	-61.0			S-54, SPT 5+5+6 REC=18", 100%		
					185			

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 15 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		MH						
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	-66.0		190	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	-71.0		195	S-56, SPT 4+7+8 REC=18", 100%		193.5 - 195.0 ft: hammer energy test performed
197.0	197.0 - 202.0 ft: CLAYEY SAND, fine grained sand; wet, gray, no HCl reaction, homogenous structure	SC	-76.0			S-57, SPT		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 16 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SC			200	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	-81.0		205	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	-86.0		210	S-59, SPT 5+6+8 REC=18", 100%		208.5 - 210.0 ft: hammer energy test performed 208.5 ft: easy drilling

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 17 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
						S-60, SPT 5+6+9 REC=18", 100%		
					215			
		ML						
						S-61, SPT 6+7+10 REC=18", 100%		
					220			
						UD-1, UNDIST REC=13", 98%		221.5 - 222.6 ft: pushed shelby tube, 13 inches, (labeled jar as UD-1) 221.5 ft: Schnabel representative changed to K. Bell 221.5 ft: Driller switched to 6" OD tricone roller bit and advanced to 221.5 ft; 223.0 - 225.0 ft: pitcher sample 223.0 ft: driller added clean water to driling fluid, driller washed and reamed while advancing (every 2.0 ft), uniform resistance,
223.0	223.0 - 228.0 ft: SILT; moist, olive and greenish gray, estimated <5% fine grained sand, weak HCl reaction, hard, homogenous structure		-102.0			UD-2, UNDIST REC=18", 75%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	
		ML						
	225.0 ft: Changes to estimated <5% shell fragments, weak HCl reaction, fine sand size highly weathered shell fragments				225	S-62, SPT 5+8+9 REC=18", 100%		

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 18 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		ML						greenish gray and brownish gray, drilling fluid, NWJ rods used during drilling 225.1 ft: switched to 3 1/2" OD tricone roller bit and advanced to 231.5 ft; uniform resistance; hard drilling, greenish gray drilling fluid 225.0 - 226.5 ft: hammer energy test performed *(continued)*
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	-107.0			S-63, SPT 7+9+12 REC=14", 78%		
					230			
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	-110.0			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	231.5 - 233.5 ft: pitcher sample 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
						S-64, SPT 7+14+16 REC=18", 100%		
					235			
237.0	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	-116.0					
						S-65, SPT 4+6+9 REC=18", 100%		238.5 - 240.0 ft: hammer energy test performed

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-356** Contract Number: 06120048 Sheet: 19 of 19

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	239.5 ft: Changes to olive and gray	SM			240			238.5 - 240.0 ft: hammer energy test performed *(continued)*
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		-120.0			UD-4, UNDIST REC=24", 100%		241.5 - 243.5 ft: pitcher sample 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
						S-66, SPT 5+7+10 REC=17", 94%		
		SM			245			
	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			-129.0		250			

Bottom of Boring at 250.0 ft.
Boring backfilled with cement/bentonite grout upon completion.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-357** Contract Number: 06120048 Sheet: 1 of 9

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

North: 216923.1 ft **East:** 961175.4 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 103.1 (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'	---
Casing Pulled	7/8	5:46 PM	Dry	---	30.2'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	0.0 - 0.7 ft: Asphalt; brick fragments, roots					S-1, SPT 1+2+3 REC=12", 67%		0.0 ft: Advanced 6 1/4 HSA to 15.0 ft, smooth, uniform drilling, orangish brown cuttings 0.0 - 0.7 ft: Jar labeled as S-1A 0.7 - 1.5 ft: Jar labeled as S-1B
0.7	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	FILL	102.4					
2.0	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		101.1			S-2, SPT 1+2+5 REC=12", 67%		
	5.0 ft: Changes to light yellowish brown with bands of orangish brown, 1" to 3" of alternating color	SP-SM			5	S-3, SPT 1+5+6 REC=16", 89%		6.5 - 11.5 ft: light yellowish brown cuttings
	7.5 ft: Changes to subangular to rounded particles; light orangish brown, homogenous structure					S-4, SPT 2+2+2 REC=13", 72%		

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-357** Contract Number: 06120048 Sheet: 2 of 9

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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%		6.5 - 11.5 ft: light yellowish brown cuttings *(continued)*
								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					S-6, SPT 3+6+9 REC=12", 67%		13.5 - 15.0 ft: SPT Hammer Energy Test performed
					15			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
		SP-SM						
	18.5 ft: Changes to subangular to rounded particles; light brown and light yellowish brown, estimated <5% fine gravel, stratified, rounded fine gravel, contains 0.5 inch layer of SILTY SAND (SM), moist, orangish brown at 19.7 ft, 1/4" to 1" layer of alternating color					S-7, SPT 4+5+11 REC=9", 50%		18.5 ft: Approx 30 gal of drilling fluid lost due to lean mud mix thickened drilling fluid
					20			
23.0	23.0 - 28.5 ft: CLAYEY SAND, fine to medium grained sand; wet, orangish	SC	80.1					23.0 ft: dark brown drilling fluid

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-357** Contract Number: 06120048 Sheet: 3 of 9

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	brown with mottles of light gray, no HCl reaction	SC			25	S-8, SPT 1+1+2 REC=16", 89%		25.5 - 26.0 ft: slighly harder drilling (possible gravel layer), light 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	74.6		30	S-9, SPT 3+1+2 REC=16", 89%		28.5 - 30.0 ft: Hammer Energy Test performed 30.0 ft: Thickened mud to remove gravel slough, light grayish brown drilling fluid
32.0	32.0 - 37.0 ft: CLAYEY SAND, fine grained sand; wet, dark gray, contains mica, no HCl reaction	SC	71.1		35	S-10, SPT 1+1+3 REC=17", 94%		35.0 ft: gray drilling fluid

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-357** Contract Number: 06120048 Sheet: 4 of 9

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
37.0	37.0 - 47.0 ft: LEAN CLAY WITH SAND; moist, dark gray, contains mica, no HCl reaction, soft, homogenous structure		66.1					
						S-11, SPT 3+3+4 REC=18", 100%		
					40			
		CL						
						S-12, SPT 3+6+6 REC=18", 100%		43.5 - 45.0 ft: Hammer Energy test performed
					45			
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		56.1					
		CL						
						S-13, SPT 4+5+6 REC=18", 100%		48.5 - 49.0 ft: Jar labeled as S-13A
49.0	49.0 - 49.3 ft: CLAYEY SAND, fine grained sand; wet, dark gray, contains mica, no HCl reaction	SC	54.1					49.0 - 49.3 ft: Jar labeled as S-13B
49.3	49.3 - 55.5 ft: LEAN CLAY WITH SAND, fine grained sand; moist, gray, contains mica, no HCl reaction, firm	CL	53.8					49.3 - 50.0 ft: Jar labeled as S-13C
					50			50.0 ft: slightly harder resistance

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-357** Contract Number: 06120048 Sheet: 5 of 9

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		CL						
						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			55.0 ft: Began continuous sampling from El +50 to -20
55.5	55.5 - 58.0 ft: SILTY SAND, fine to medium grained sand; moist, dark gray, contains mica, no HCl reaction	SM	47.6			S-15, SPT 5+6+7 REC=18", 100%		
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	45.1			S-16, SPT 6+13+22 REC=18", 100%		58.5 - 60.0 ft: Hammer Energy Test performed
					60			
	61.0 ft: Changes to subangular particles; dark gray 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					S-17, SPT 12+32+21 REC=12", 67%		61.0 - 62.1 ft: Jar labeled as S-17A
62.1	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	SM	41.0					62.1 - 62.5 ft: Jar labeled as S-17B 62.1 ft: Harder drilling due to cemented sands
63.4		SP-SM	39.7			S-18, SPT 9+12+15		

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-357** Contract Number: 06120048 Sheet: 6 of 9

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	highly oxidized, no HCl reaction							
	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-SM			65			
65.5	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	37.6			S-19, SPT 23+26+25 REC=17", 94%		66.0 ft: light gray drilling fluid
	68.5 ft: Changes to fine grained sand				70	S-20, SPT 21+20+3 REC=15", 83%		
70.5	70.5 - 73.0 ft: POORLY GRADED SAND, fine grained sand; wet, gray, estimated <5% silt, contains mica, no HCl reaction, homogenous structure	SP	32.6			S-21, SPT 14+9+7 REC=11", 61%		
73.0	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	SP-SM	30.1			S-22, SPT 2+4+8 REC=18", 100%		73.0 ft: Faster drilling rate at 73 ft (very soft material) 73.5 ft: Lost drilling fluid through auger casing @ 73.5 ft (~ 100 gals) 73.5 - 75.0 ft: Hammer Energy Test performed 73.5 - 74.2 ft: Jar labeled as S-22A 74.2 - 75.0 ft: Jar labeled as S-22B
74.2	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	28.9		75			
75.5	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	27.6			S-23, SPT 7+11+11 REC=6", 33%		

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-357** Contract Number: 06120048 Sheet: 7 of 9

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
78.0	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	25.1			S-24, SPT 50/1" REC=1", 100%		79.0 ft: rig chatter, hard drilling, slow advancement
	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			80	S-25, SPT 13+24+54/1" REC=13", 100%		80.0 - 80.9 ft: Jar labeled as S-25A
80.9	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 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	SM	22.2			S-26, SPT 50/2.5" REC=2.5", 100%		80.9 - 81.1 ft: Jar labeled as S-25B 82.1 ft: easier drilling 83.2 ft: gray drilling fluid w/ silt cuttings, harder drilling, slow advancement
85.2	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	SP-SM	17.9		85	S-27, SPT 12+12+11 REC=18", 100% S-28, SPT 7+11+22 REC=17", 94%		85.2 ft: rig chatter, easier drilling 88.5 - 90.0 ft: Hammer Energy Test performed 88.5 ft: cuttings contain fine to medium sand and shell fragments
	90.5 ft: Changes to fine to coarse grained sand; light gray with speckles of brownish				90			

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-357** Contract Number: 06120048 Sheet: 8 of 9

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	white, estimated 30 - 45% shell fragments	SP-SM				S-29, SPT 8+6+7 REC=17", 94%		91.0 - 92.5 ft: Hammer Energy Test performed
	93.5 ft: Changes to fine to medium grained sand; gray with speckles of brownish white, estimated 15 - 25% shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)					S-30, SPT 5+9+10 REC=17", 94%		
					95			
95.5	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)	SM	7.6			S-31, SPT 8+12+16 REC=18", 100%		
98.0	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	SM	5.1			S-32, SPT 7+10+12 REC=18", 100%		
					100			
100.5	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)	SP-SM	2.6			S-33, SPT 3+4+8 REC=18", 100%		101.0 - 103.5 ft: Hammer Energy Test performed
	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					S-34, SPT 3+3+3 REC=18", 100%		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-357** Contract Number: 06120048 Sheet: 9 of 9

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
105.0	reaction (with soil)	SP-SM	-1.9		105			

Bottom of Boring at 105.0 ft.
Terminated boring due to lack of return and grout/bentonite mud take as requested
Boring backfilled with cement/bentonite grout upon completion

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 COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-357A** Contract Number: 06120048 Sheet: 1 of 9

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

North: 216928.8 ft **East:** 961167 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 103.0 (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)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	0.0 - 23.0 ft: POORLY GRADED SAND WITH SILT; see B-357 for lithologic description	SP-SM			5 10 15 20			0.0 ft: Material descrptions and USCS symbols are based on observations made at B-357 of the 2008 investigation. 0.0 ft: These descriptions, symbols and boundaries provide a general indication of material changes with depth, but do not represent detailed condition. Refer to B-357 for more detailed conditions. 0.0 ft: advanced 6-1/4 ID HSA to 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 fliud) 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)
23.0	23.0 - 28.5 ft: CLAYEY SAND	SC	80.0					

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-357A** Contract Number: 06120048 Sheet: 2 of 9

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SC						25.0 ft: see end of boring log for remarks
28.5	28.5 - 32.0 ft: SILTY SAND	SM	74.5		30			
32.0	32.0 - 37.0 ft: CLAYEY SAND	SC	71.0		35			
37.0	37.0 - 47.0 ft: LEAN CLAY WITH SAND	CL	66.0		40 45			
47.0	47.0 - 49.0 ft: SANDY LEAN CLAY	CL	56.0					
49.0 49.3	49.0 - 49.3 ft: CLAYEY SAND 49.3 - 55.5 ft: LEAN CLAY WITH SAND	SC CL	54.0 53.7		50 55			
55.5	55.5 - 58.0 ft: SILTY SAND	SM	47.5					
58.0	58.0 - 62.1 ft: POORLY GRADED WITH	SP-SM	45.0					

(continued)

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-357A** Contract Number: 06120048 Sheet: 3 of 9

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	SILT	SP-SM			60			
62.1	62.1 - 63.4 ft: SILTY SAND	SM	40.9					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
63.4	63.4 - 65.5 ft: POORLY GRADED SAND WITH SILT	SP-SM	39.6		65			
65.5	65.5 - 73.0 ft: POORLY GRADED SAND	SP	37.5		70			
73.0	73.0 - 74.2 ft: POORLY GRADED SAND WITH SILT AND GRAVEL	SP-SM	30.0					
74.2	74.2 - 80.9 ft: SILTY SAND	SM	28.8		75 80			74.0 ft: see end of boring log for remarks
80.9	80.9 - 85.2 ft: SILTY SAND WITH GRAVEL	SM	22.1					
85.2	85.2 - 95.5 ft: POORLY GRADED SAND WITH SILT	SP-SM	17.8		85 90			

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-357A** Contract Number: 06120048 Sheet: 4 of 9

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP-SM			95			
95.5	95.5 - 100.5 ft: SILTY SAND	SM	7.5					98.5 ft: drillers advanced 3-1/2" OD tricone roller bit to 250 ft 98.5 - 106.0 ft: smooth drilling, gray drilling fluid
					100			
100.5	100.5 - 106.0 ft: POORLY GRADED SAND WITH SILT	SP-SM	2.5					
					105			
106.0	106.0 - 107.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand; wet, greenish gray, estimated 15 - 25% shell fragments, highly to moderately weathered shells, no HCl reaction (with shells), weak HCl reaction (with soils)	SP-SM	-3.0			S-1, SPT 6+7+10 REC=18", 100%		
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	-4.5			S-2, SPT 50/5" REC=5", 100%		107.5 ft: rig chatter 109.0 - 111.0 ft: hard drilling
					110			
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 113.5 ft: Changes to gray, estimated <5% shell fragments, weak HCl reaction, moderately weathered shells	SP-SM	-8.0			S-3, SPT 11+15+33 REC=18", 100%		111.0 - 113.5 ft: moderate drilling resistance
						S-4, SPT 12+16+30 REC=18", 100%		113.5 - 116.0 ft: slight rig chatter
					115			
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	-12.5			S-5, SPT 8+8+16 REC=18", 100%		116.0 - 118.5 ft: smooth drilling
						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
					120			
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	-17.5			S-7, SPT 6+7+21 REC=18", 100%		
123.0	123.0 - 127.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand; wet, brownish gray, estimated <5% shell fragments, homogenous structure,	SP-SM	-20.0			S-8, SPT 5+6+9 REC=18", 100%		123.5 - 125.0 ft: last sample of continuous sampling
					125			

(continued)

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-357A** Contract Number: 06120048 Sheet: 5 of 9

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	moderately weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM						123.5 - 128.5 ft: silt and fine shell fragments in cuttings *(continued)*
127.5	127.5 - 137.0 ft: SILTY SAND, fine grained sand; wet, dark gray, estimated <5% shells, weak HCl reaction, highly weathered shells	SM	-24.5		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	-34.0		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	-39.0		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	-44.5		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)				155	S-14, SPT 5+7+9 REC=18", 100%		
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 *(continued)*	ML	-54.0			S-15, SPT 4+5+7 REC=17", 94%		

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-357A** Contract Number: 06120048 Sheet: 6 of 9

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	reaction (with soil)	ML			165	S-16, SPT 5+7+7 REC=0", 0%		158.5 - 163.5 ft: fine sand, fine shell fragments and silt clumps in cuttings *(continued)* 163.5 - 165.0 ft: no recovery possibly due to insufficient suction in spoon to pull soil up
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	MH	-64.0		170	S-17, SPT 5+6+9 REC=16", 89%		165.0 ft: drillers cleaned out tub and added 1/2 of a bag of bentonite to 150 gallons clean water 171.0 ft: slower drilling
	173.5 ft: Changes to olive gray, weak HCl reaction, firm				175	S-18, SPT 5+7+9 REC=18", 100%		
177.0	177.0 - 181.0 ft: SILTY SAND, fine grained sand; wet, gray, estimated <5% shell fragments, weak HCl reaction, homogenous structure	SM	-74.0		180	S-19, SPT 4+7+9		
181.0	181.0 - 187.5 ft: SANDY SILT, fine grained sand; wet, olive gray, estimated <5% shell fragments, weak HCl reaction, firm, homogenous structure	ML	-78.0		185	S-20, SPT 4+7+8 REC=18", 100%		181.0 ft: harder drilling 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	-84.5		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	SC	-89.5					

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-357A** Contract Number: 06120048 Sheet: 7 of 9

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	<5% mica, no HCl reaction, homogenous structure				195	S-22, SPT 6+8+9 REC=18", 100%		193.5 - 198.5 ft: uniform drilling *(continued)*
	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 structure, moderately weathered shell fragments, shells increase with depth	SM	-104.0		210	S-25, SPT 4+5+12 REC=18", 100%		207.0 ft: easier drilling 208.5 - 213.5 ft: uniform drilling resistance
212.5	212.5 - 214.6 ft: SILTY SAND, fine grained sand; wet, olive gray, estimated <5% shell fragments	SM	-109.5		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	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	-111.6					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	-114.5		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	-119.0		225	S-28, SPT 5+7+11		223.5 - 228.5 ft: easy drilling

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-357A** Contract Number: 06120048 Sheet: 8 of 9

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
227.5	227.5 - 232.0 ft: SILTY SAND, fine grained sand; wet, olive gray, weak HCl reaction, homogenous structure	SM	-124.5		230	S-29, SPT 5+7+10 REC=18", 100%		223.5 - 228.5 ft: easy drilling *(continued)*
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) 237.0 ft: Changes to olive gray, no HCl reaction	SM	-129.0		235 240	S-30, SPT 5+7+8 REC=18", 100% S-31, SPT 4+10+11 REC=18", 100%		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
242.5	242.5 - 250.0 ft: SANDY ELASTIC SILT, fine grained sand; wet, olive gray, weak HCl reaction, firm, homogenous structure 247.0 ft: Changes to estimated <5% shell fragments, no HCl reaction, highly weathered shell fragments	MH	-139.5		245 250	S-32, SPT 6+8+10 REC=18", 100% S-33, SPT 6+8+12 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			-147.0					

(continued)

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

Bottom of Boring at 250.0 ft.
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.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-771** Contract Number: 06120048 Sheet: 1 of 4

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

North: 219268.2 ft **East:** 960931.9 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	7/24	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	SAMPLING DATA	TESTS	REMARKS
	0.0 - 2.0 ft: FILL, sampled as sandy lean clay with gravel, fine to medium grained sand; moist, brown, estimated 15 - 25% crushed stone, no HCl reaction	FILL				S-1, SPT 3+4+7 REC=11", 61%	MC = 7.2%	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. 3.0 - 3.3 ft: Rig chatter
2.0	2.0 - 4.5 ft: 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, estimated < 5% coarse sand size fresh shell fragments at 3.8 ft, strong HCl reaction (with shells), no HCl reaction (with soil)	FILL	8.6			S-2, SPT 1+6+7 REC=11", 61%	MC = 11.3%	
4.5		FILL	6.1		5	S-3, SPT 5+7+7 REC=17", 94%	MC = 14.2%	5.0 - 7.5 ft: Uniform drilling resistance, smooth drilling
7.0	4.5 - 7.0 ft: 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	SM	3.6			S-4, SPT 1/12"+1 REC=9", 50%	MC = 18.4%	7.5 - 10.0 ft: light brown cuttings 7.5 - 8.8 ft: Jar labeled as S-4A
8.8		CL	1.8					
9.5	7.0 - 8.8 ft: SILTY SAND, medium grained sand, rounded particles; wet, orangish brown with bands of light gray, no HCl reaction	SM	1.1		10	S-5, SPT 1/12"+2 REC=5", 28%	MC = 20.7%	8.8 - 9.0 ft: Jar labeled as S-4B
	8.8 - 9.5 ft: SANDY LEAN CLAY, medium grained sand, rounded particles; wet, light gray, no HCl reaction, soft							
12.5	9.5 - 12.5 ft: SILTY SAND, medium to coarse grained sand, rounded particles; wet, orangish brown and light gray, no HCl reaction		-1.9			S-6, SPT 4+4+2 REC=14", 78%	MC = 29.3%	
	12.5 - 17.5 ft: 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			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 14.5 ft: uniform drilling resistance, smooth drilling, light gray drilling fluid.
17.5			-6.9					
	17.5 - 22.0 ft: 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 reaction (with shells), no HCl reaction (with soil)	SP			20	S-7, SPT 4+4+7 REC=15", 83%	MC = 25.6%	
22.0			-11.4					
	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	SP-SM				S-8, SPT 3+9+12 REC=18", 100%	MC = 37.4%	

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-771** Contract Number: 06120048 Sheet: 2 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP-SM						23.5 - 28.5 ft: switched to 6" OD tricone bit and reamed to 28.5 ft, greenish gray fluid during reaming *(continued)*
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		30	S-9, SPT 6+32+50 REC=18", 100%	MC = 17.6%	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: CLAYEY SAND, fine to medium grained sand; moist, olive gray, contains mica, weak HCl reaction	SC	-20.4		35	UD-1, UNDIST REC=24", 100% S-10, SPT 3+6+11 REC=18", 100%	LL = 36 PL = 23 MC = 28.5% PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf MC = 36.7%	31.5 - 33.5 ft: pitcher sample 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		40	S-11, SPT 6+9+9 REC=18", 100%	MC = 57.7%	
41.0	41.0 - 43.5 ft: CLAYEY SAND, fine to medium grained sand; moist, olive gray, contains mica, weak HCl reaction	SC	-30.4			UD-2, UNDIST REC=24", 100%	LL = 59 PL = 18 MC = 33.0% PP = 4.50 tsf	41.5 - 43.5 ft: pitcher sample
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		45	S-12, SPT 5+7+11 REC=18", 100%	PP = 4.50 tsf PP = 4.50 tsf MC = 40.1%	
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%	MC = 30.3%	
51.5	51.5 - 53.5 ft: CLAYEY SAND, fine to coarse grained sand; moist, olive gray, estimated <5% fine gravel, contains mica, contains shell fragments, weak HCl reaction, highly weathered shell fragments	SC	-40.9			UD-3, UNDIST REC=24", 100%	LL = 52 PL = 19 MC = 27.8% PP = 4.50 tsf	51.5 - 53.5 ft: pitcher sample
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%	PP = 4.50 tsf PP = 4.50 tsf MC = 40.6%	
57.0	57.0 - 61.0 ft: SILT; moist, olive gray, contains mica, strong HCl reaction, firm	ML	-46.4					

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-771** Contract Number: 06120048 Sheet: 3 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		ML			60	S-15, SPT 8+8+11 REC=18", 100%	MC = 62.8%	58.5 - 61.5 ft: thinned drilling fluid by adding water *(continued)*
61.0	61.0 - 67.0 ft: SANDY FAT CLAY, 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)	CH	-50.4		65	UD-4, UNDIST REC=24", 100% S-16, SPT 5+8+10 REC=18", 100%	LL = 64 PL = 21 MC = 43.9% PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf MC = 40.8%	61.5 ft: flushed boring to remove settled cuttings 61.5 - 63.5 ft: pitcher sample
67.0	67.0 - 76.5 ft: CLAYEY SAND, fine grained sand; moist, olive gray, contains mica, weak HCl reaction, firm	SC	-56.4		70	S-17, SPT 5+7+9 REC=18", 100% UD-5, UNDIST REC=24", 100% S-18, SPT 7+9+11 REC=18", 100%	MC = 45.2% LL = 55 PL = 21 MC = 33.4% PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf LL = 64 PL = 26 MC = 41.0%	68.5 - 71.5 ft: thinned drilling fluid by adding water 71.5 - 73.5 ft: pitcher sample
76.5	76.5 - 81.0 ft: ELASTIC SILT WITH SAND, fine to medium grained sand; moist, olive gray, contains mica, weak HCl reaction, firm	MH	-65.9		75			
81.0	81.0 - 83.0 ft: FAT CLAY; moist, olive gray, estimated <5% fine grained sand, contains mica, weak HCl reaction, firm	CH	-70.4		80	S-19, SPT 8+8+11 REC=18", 100% UD-6, UNDIST REC=24", 100%	LL = 122 PL = 74 MC = 71.2% LL = 136 PL = 37 MC = 68.5% PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	81.5 - 83.5 ft: pitcher sample
83.0	83.0 - 91.0 ft: SANDY ELASTIC SILT, fine to coarse grained sand; moist, olive gray, contains mica, weak HCl reaction, firm 88.5 ft: Changes to fine to medium grained sand	MH	-72.4		85	S-20, SPT 9+10+11 REC=18", 100% S-21, SPT 7+9+11 REC=18", 100%	LL = 119 PL = 65 MC = 73.9% LL = 96 PL = 54 MC = 63.6%	
91.0	91.0 - 93.5 ft: FAT CLAY WITH SAND, fine to medium grained sand; moist, olive gray, contains mica, weak HCl reaction, *(continued)*	CH	-80.4		90	UD-7, UNDIST REC=24", 100%	LL = 140 PL = 32	91.5 - 93.5 ft: pitcher sample

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-771** Contract Number: 06120048 Sheet: 4 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	firm	CH					MC = 68.6% PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf LL = 110 PL = 71 MC = 67.3%	91.5 - 93.5 ft: pitcher sample *(continued)*
93.5	93.5 - 97.0 ft: SANDY ELASTIC SILT, fine to medium grained sand; moist, olive gray, contains mica, weak HCl reaction, firm	MH	-82.9		95	S-22, SPT 8+10+12 REC=18", 100%		
97.0	97.0 - 100.0 ft: ELASTIC SILT WITH SAND, fine to medium grained sand; moist, olive gray, contains mica, weak HCl reaction, firm	MH	-86.4					
100.0			-89.4		100	S-23, SPT 9+10+12 REC=18", 100%	LL = 92 PL = 52 MC = 48.7%	

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

Additional Remarks
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

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-772** Contract Number: 06120048 Sheet: 1 of 4

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

North: 219323.9 ft **East:** 960876.1 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	SAMPLING DATA	TESTS	REMARKS
0.2	0.0 - 0.2 ft: Topsoil; organics, grass		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. 2.5 ft: Uniform drilling resistance, smooth drilling
	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	FILL						
2.0	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	FILL	8.6			S-2, SPT 5+14+19 REC=15", 83%		
					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 10.0 ft: Changes to medium grained sand, subrounded particles; estimated <5% fine gravel	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	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%		
					15			
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%		18.5 - 23.5 ft: drilling fluid cuttings contain coarse sand sized cemented sands
					20			
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	SP-SM	-11.9			S-8, SPT 8+10+16		

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-772** Contract Number: 06120048 Sheet: 2 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	sands, fine gravel size highly weathered shell fragments, weak to moderate cementation	SP-SM						
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		30	S-9, SPT 25+50/3" REC=8", 89%		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		35	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		40	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: pitcher sampler 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		45	S-12, SPT 4+8+11 REC=18", 100%		
	48.5 ft: Changes to estimated 5 - 10% shell fragments, fresh to moderately weathered shell fragments				50	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 ft: Changes to estimated <5% shell fragments, moderately weathered shell fragments, strong HCl reaction (with shells and soil)					UD-2, UNDIST REC=13.5", 56%		51.5 - 53.5 ft: pitcher sampler recovery, sample placed in jar and labeled as UD-2
	53.5 ft: 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)				55	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: pitcher sampler 56.5 ft: switched to 3-1/2" OD
58.5			-47.9					

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-772** Contract Number: 06120048 Sheet: 3 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	58.5 - 62.5 ft: SILT WITH SAND, fine grained sand; moist, olive gray, contains mica, strong HCl reaction, firm	ML ML			60	S-15, SPT 9+10+11 REC=18", 100%		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		65	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		70	S-17, SPT 8+10+12 REC=18", 100%		68.5 - 70.0 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid
					75	S-18, SPT 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	ML	-66.4		80	S-19, SPT 7+8+9 REC=18", 100%		
	83.5 ft: Changes to weak HCl reaction				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	ML	-76.4		90	S-21, SPT 7+8+9 REC=18", 100%		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-772** Contract Number: 06120048 Sheet: 4 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		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				100	S-23, SPT 9+10+12 REC=18", 100%		
100.0			-89.4					

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

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773** Contract Number: 06120048 Sheet: 1 of 13

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

North: 219241.3 ft **East:** 961045.9 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'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
0.3	0.0 - 0.3 ft: Rootmat and topsoil		7.6			S-1, SPT 2+7+8 REC=8", 44%	MC = 12.8%	0.0 - 2.5 ft: advanced 4 1/4" ID HSA to 9 ft 0.0 - 2.5 ft: uniform drilling resistance, smooth drilling, minor grinding on fine gravel, orangish brown cuttings.
	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						
2.0	2.0 - 4.5 ft: PROBABLE FILL, sampled as silty 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 think layer of sandy clay, fine sand, moist, light gray, stratified	FILL	5.9			S-2, SPT 2+3+5 REC=15.5", 86%	LL = NP MC = 12.4%	2.5 - 5.0 ft: light brown cuttings
4.5	4.5 - 7.0 ft: PROBABLE FILL, sampled as silty sand, fine to medium grained sand; wet, light gray, no HCl reaction, stratified 0.5 inch with bands of light brownish yellow and light orange	FILL	3.4		5	S-3, SPT 1+1+1 REC=18", 100%	LL = NP MC = 21.1%	5.0 - 7.5 ft: driller advanced in 1st gear to maintain borehole integrity, light yellowish brown cuttings
7.0	7.0 - 9.5 ft: PROBABLE FILL, sampled as silty 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	0.9			S-4, SPT WOH+18 REC=15", 83%	LL = NP MC = 19.1%	7.5 - 9.0 ft: light brownish gray cuttings
9.5	9.5 - 11.2 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand,	SP-SM	-1.6					9.0 ft: pulled out 4 1/4" ID HSA, installed 6" ID PVC casing into borehole and

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773** Contract Number: 06120048 Sheet: 2 of 13

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	subrounded particles; wet, gray, no HCl reaction, homogenous structure, coarse sand crumbles	SP-SM				S-5, SPT WOH+1+12 REC=9", 50%	LL = NP MC = 34.4%	grouted annulus 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
11.2	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	-3.3					
12.0	12.0 - 15.9 ft: SILTY SAND, fine to coarse grained sand, angular to 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	-4.1			S-6, SPT 5+17+27 REC=13", 72% S-7, SPT 15+6+6 REC=16", 89%	LL = NP MC = 15.4% MC = 22.4%	9.0 - 10.0 ft: uniform drilling resistance, smooth drilling, light gray drilling fluid 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 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
15.9	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)	SP-SM	-8.0		15			
19.5	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)	SM	-11.6		20	S-8, SPT 5+12+19 REC=18", 100%	LL = NP MC = 29.7%	19.5 - 20.0 ft: slightly harder drilling with rig chatter 20.0 - 25.0 ft: uniform drilling resistance, smooth drilling

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773** Contract Number: 06120048 Sheet: 3 of 13

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SM						20.0 - 25.0 ft: uniform drilling resistance, smooth drilling *(continued)*
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%	MC = 41.0%	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%	LL = NP MC = 37.9%	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	S-11, SPT 4+6+8 REC=18", 100%	MC = 55.8%	35.0 - 40.0 ft: gray drilling fluid

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773** Contract Number: 06120048 Sheet: 4 of 13

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		ML						35.0 - 40.0 ft: gray drilling fluid *(continued)*
38.5	38.5 - 44.0 ft: CLAYEY 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)	SC	-30.6		40	S-12, SPT 3+4+6 REC=18", 100%	LL = 45 PL = 24 MC = 40.8%	
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%	MC = 35.8%	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	LL = 65 PL = 33	

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773** Contract Number: 06120048 Sheet: 5 of 13

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SM				REC=18", 100%	MC = 44.3%	
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 reaction (with shells), weak to strong HCl reaction (with soil)		-46.1					
		SM			55	S-15, SPT 4+5+7 REC=18", 100%	LL = 80 PL = 44 MC = 46.4%	
59.0	59.0 - 74.0 ft: SILTY SAND, fine grained sand; moist, olive gray, contains mica, weak HCl reaction, homogenous structure		-51.1					
	60.9 ft: Changes to olive gray with streaks of white, estimated <5% shell fragments, highly weathered shell fragments, strong HCl reaction (with shells)	SM			60	S-16, SPT 4+4+6 REC=18", 100%	LL = 66 PL = 37 MC = 47.3%	60.0 - 65.0 ft: clumps of fine silty sand, fine to medium sand and medium sand sized shell fragments

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773** Contract Number: 06120048 Sheet: 6 of 13

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	65.0 ft: Changes to olive gray				65	S-17, SPT 3+4+5 REC=18", 100%	LL = 64 PL = 27 MC = 41.6%	
		SM			70	S-18, SPT 3+4+6 REC=18", 111%	LL = 58 PL = 31 MC = 38.3%	
74.0	74.0 - 94.0 ft: SANDY ELASTIC SILT, fine grained sand; moist, grayish green, contains mica, strong HCl reaction, hard, homogenous structure		-66.1					
		MH			75	S-19, SPT 4+6+7 REC=18", 100%	LL = 103 PL = 45 MC = 67.5%	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)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773** Contract Number: 06120048 Sheet: 7 of 13

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
								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%	LL = 132 PL = 53 MC = 77.2%	
		MH						
					85	S-21, SPT 4+5+7 REC=18", 100%	LL = 123 PL = 57 MC = 69.5%	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%	LL = 129 PL = 50 MC = 84.1%	

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773** Contract Number: 06120048 Sheet: 8 of 13

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		MH						90.0 - 95.0 ft: cuttings contain clumps of fine sandy silt/silty sand, fine to medium sand and medium sand sized shell fragments *(continued)*
94.0	94.0 - 99.0 ft: CLAYEY 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)	SC	-86.1		95	S-23, SPT 7+7+9 REC=18", 100%	LL = 73 PL = 32 MC = 41.6%	
99.0	99.0 - 108.5 ft: SANDY ELASTIC SILT, fine to medium 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	MH	-91.1		100	S-24, SPT 5+8+11 REC=18", 100%	LL = 97 PL = 58 MC = 54.2%	

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773** Contract Number: 06120048 Sheet: 9 of 13

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	105.0 ft: Changes to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	MH			105	S-25, SPT 5+5+7 REC=18", 100%	LL = 109 PL = 59 MC = 59.1%	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 *(continued)*
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%	LL = 128 PL = 79 MC = 78.5%	111.5 - 113.5 ft: softer drilling, faster penetration rate, greenish gray drilling fluid
114.0	114.0 - 119.0 ft: POORLY GRADED SAND WITH SILT, 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 (with shells), no HCl reaction (with soil), 0.5 inch pockets of SANDY SILT (ML)	SP-SM	-106.1		115	S-27, SPT 5+3+6 REC=18", 100%	LL = NP MC = 35.5%	113.5 - 115.0 ft: slightly harder drilling with uniform drilling resistance, smooth drilling

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773** Contract Number: 06120048 Sheet: 10 of 13

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP-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%	LL = 49 PL = 34 MC = 42.4%	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	SM			125	S-29, SPT 3+4+6 REC=18", 100%	LL = 60 PL = 35 MC = 45.3%	125.0 - 130.0 ft: grayish green drilling fluid
					130	S-30, SPT 3+5+8 REC=18", 100%	LL = 69 PL = 36 MC = 46.7%	

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773** Contract Number: 06120048 Sheet: 11 of 13

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
								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 *(continued)*
		SM						
	135.0 ft: Changes to no to weak HCl reaction				135	S-31, SPT 3+5+9 REC=18", 100%	LL = 73 PL = 42 MC = 49.4%	135.0 - 140.0 ft: grayish green drilling fluid
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		-130.1					
		SM			140	S-32, SPT 5+6+10 REC=18", 100%	LL = 91 PL = 50 MC = 58.8%	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: SANDY ELASTIC SILT, fine grained sand; moist, grayish green, contains mica, weak HCl reaction, homogenous structure	MH	-136.1					

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773** Contract Number: 06120048 Sheet: 12 of 13

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
					145	S-33, SPT 4+7+8 REC=18", 100%	LL = 97 PL = 55 MC = 56.0%	
						S-34, SPT 4+7+9 REC=18", 100%	LL = 112 PL = 63 MC = 66.8%	
					150			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
		MH						
					155			

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773** Contract Number: 06120048 Sheet: 13 of 13

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		MH			160			
165.0			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 accomodate geophysical probe.
Performed downhole geophysical logging upon completion of ream.

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773A** Contract Number: 06120048 Sheet: 1 of 5

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

North: 219233.1 ft **East:** 961052.9 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 8.3 (ft) **Total Depth:** 150.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Start of Day	8/8	7:00 AM	2.0'	8.5'	---
Start of Day	8/11	9:00 AM	6.0'	8.5'	30.0'
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 DEPTH	SAMPLING DATA	TESTS	REMARKS
	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			5 10			0.0 ft: Material descriptions and USCS symbols are based on observations of limited UD samples. These descriptions, symbols and boundaries provide a general indication of material changes with depth but do not represent detailed conditions. 0.0 ft: Refer to B-773 of the 2008 investigation for more detailed material descriptions in this area.
					15	UD-1, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	13.0 - 15.0 ft: pitcher sample 13.0 ft: advanced 6" OD tricone roller bit to 150 ft 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
18.0	18.0 - 28.0 ft: CLAYEY SAND, fine to coarse grained sand; moist, olive gray, contains shells, strong HCl reaction (with shells), weak HCl reaction (with soil)	SC	-9.7		20			
						UD-2, UNDIST REC=15.5", 65%	LL = 42 PL = 20 MC = 31.4% PP > 4.50 tsf	23.0 - 25.0 ft: pitcher sample

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773A** Contract Number: 06120048 Sheet: 2 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SC					PP > 4.50 tsf PP > 4.50 tsf	23.0 - 33.0 ft: uniform drilling resistance, smooth drilling harder drilling at 26.5 ft, slight rig chatter at 28 ft (possilbe shells), smooth drilling 25 ft to 33 ft, light gray drilling fluid *(continued)*
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)		-19.7		30			
		ML				UD-3, UNDIST REC=19", 79%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	33.0 - 35.0 ft: pitcher sample 33.0 - 43.0 ft: uniform drilling resistance, smooth drilling, light gray drilling fluid
					35			
37.0	37.0 - 72.0 ft: SILTY SAND, fine to medium grained sand; moist, olive gray, contains shell fragments, weak HCl reaction		-28.7					
					40			
						UD-4, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	43.0 - 45.0 ft: pitcher sample 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
					45			
		SM						
					50			
						UD-5, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	53.0 - 55.0 ft: pitcher sample
					55			

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773A** Contract Number: 06120048 Sheet: 3 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	63.0 ft: Changes to dark olive gray, strong HCl reaction	SM			60 65 70	UD-6, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	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 *(continued)* 63.0 - 65.0 ft: pitcher sample 63.0 - 73.0 ft: cuttings observed are silty sand, fine to medium sand
72.0	72.0 - 92.0 ft: FAT CLAY; moist, grayish green, estimated <5% fine grained sand, contains mica, weak HCl reaction		-63.7		75	UD-7, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	73.0 - 75.0 ft: pitcher sample
	83.0 ft: Changes to olive green and grayish green	CH			80 85 90	UD-8, UNDIST REC=19", 79%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf MC = 70.7% LL = 143 PL = 33	83.0 - 85.0 ft: pitcher sample 83.0 - 93.0 ft: olive gray and grayish green drilling fluid, cuttings observed are clumps of silty sand fine sand
92.0		CH	-83.7					

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773A** Contract Number: 06120048 Sheet: 4 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	92.0 - 101.0 ft: FAT CLAY WITH SAND, fine grained sand; moist, olive gray, contains mica, weak HCl reaction	CH			95	UD-9, UNDIST REC=21", 88%	LL = 116 PL = 26 MC = 54.0% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	93.0 - 95.0 ft: pitcher sample 93.0 - 103.0 ft: smooth and easy drilling, olive gray drilling fluid, sandy silty fine to medium sand cuttings
					100			
101.0	101.0 - 109.0 ft: FAT CLAY, fine to medium grained sand; moist, olive gray, contains shells, contains mica, weak HCl reaction	CH	-92.7		105	UD-10, UNDIST REC=24", 100%	LL = 110 PL = 25 MC = 22.4% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	103.0 - 105.0 ft: pitcher sample 103.0 - 113.0 ft: smooth drilling
109.0	109.0 - 121.0 ft: CLAYEY SAND, fine to medium grained sand; moist, olive gray, contains shell fragments, contains mica, weak HCl reaction	SC	-100.7		110			
					115	UD-11, UNDIST REC=22", 92%	LL = 43 PL = 22 MC = 32.1% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	113.0 - 115.0 ft: pitcher sample 113.0 - 123.0 ft: silty sand fine to medium sand cuttings
					120			
121.0	121.0 - 134.0 ft: CLAYEY SAND, fine grained sand; moist, olive gray, contains mica, weak HCl reaction	SC	-112.7		125	UD-12, UNDIST REC=23", 96%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf LL = 59 PL = 26 MC = 40.0%	123.0 - 125.0 ft: pitcher sample 123.0 - 136.0 ft: dark olive gray drilling fluid

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773A** Contract Number: 06120048 Sheet: 5 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
								123.0 - 136.0 ft: dark olive gray drilling fluid *(continued)*
	130.0 ft: Changes to fine to medium grained sand	SC			130			
134.0	134.0 - 150.0 ft: SANDY SILT, fine grained sand; moist, olive gray, contains mica, weak HCl reaction		-125.7					
					135	UD-13, UNDIST REC=22", 92%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	136.0 - 138.0 ft: pitcher sample 136.0 - 148.0 ft: olive gray drilling fluid
		ML			140			
					145			
						UD-14, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	148.0 - 150.0 ft: pitcher sample
150.0			-141.7		150			

Bottom of Boring at 150.0 ft.
Boring backfilled with cuttings upon completion.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773B** Contract Number: 06120048 Sheet: 1 of 5

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: J. Evans

Schnabel Representative: K. Bell

Equipment: Failing 1500 Truck; N3

Method: 6" O.D. Drag Bit (Mud Rotary)

Hammer Type: Auto Hammer (140 lb)

Dates Started: 10/16/08 **Finished:** 10/23/08

North: 219248.1 ft **East:** 961039.9 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 8.0 (ft) **Total Depth:** 150.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	10/16	1:20 PM	5.0'	---	---
Start of Day	10/17	8:30 AM	2.0'	---	---
Start of Day	10/20	9:45 AM	6.0'	---	---
Start of Day	10/22	1:30 PM	1.0'	---	---
Completion	10/22	4:30 PM	1.5'	---	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	0.0 - 10.0 ft: CLAYEY SAND, fine to coarse grained sand, subrounded particles; wet, orangish brown and gray, no HCl reaction	SC			5	UD-1, UNDIST REC=24", 100%	PP = 0.25 tsf PP = 0.25 tsf PP = 0.25 tsf	0.0 ft: Material descriptions and USCS symbols are based on observations of cuttings contained in drilling fluid and limited UD samples where available. 0.0 ft: These descriptions, symbols and boundaries provide a general indication of material changes with depth, but do not represent detailed conditions. 0.0 ft: Refer to B-773 of the 2008 investigation for more detailed material descriptions in this area. 0.0 ft: advavnced 6" OD drag bit to 150.0 ft; driller mixed 1 bag of quick gel with 300 gals of water to make drilling fluid 0.0 - 5.0 ft: heavy bit chatter from 2.0 to 2.4 ft; smooth drilling below 2.4 ft, light brown drilling fluid, clumps of quick gel/clayey sand and fine to medium sand in cuttings 5.0 - 7.0 ft: pitcher sample 5.0 - 15.0 ft: uniform drilling resistance, slight rig chatter from 10.0 to 11.0 ft (possible gravel)
10.0	10.0 - 20.0 ft: POORLY GRADED SAND WITH GRAVEL, fine to medium grained sand; wet, light gray, contains shells, subangular fine gravel, strong HCl reaction	SP	-2.0		10 15	UD-2, UNDIST REC=22", 92%	PP = 0.50 tsf PP = 0.50 tsf PP = 1.00 tsf	
20.0	20.0 - 33.0 ft: SILTY SAND, fine to medium grained sand; moist, light olive gray, contains shells, strong HCl reaction	SM	-12.0		20			

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773B** Contract Number: 06120048 Sheet: 2 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SM			30	UD-3, UNDIST REC=21", 88%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	15.0 - 17.0 ft: pitcher sample 15.0 - 25.0 ft: uniform drilling resistance, slight rig chatter throughout, light brown drilling fluid, poorly graded sand and gravel (subrounded to subangular fine gravel) in cuttings 25.0 - 27.0 ft: pitcher sample 25.0 - 35.0 ft: uniform drilling resistance, smooth and easy drilling, light brownish gray drilling fluid clumps of silty sand, fine to medium sand and fine to medium sand size fresh to moderately weathered shells in cuttings
33.0	33.0 - 41.0 ft: SANDY SILT, fine to medium grained sand; moist, light olive gray, contains shells, weak HCl reaction (with shells), no HCl reaction (with soil)	ML	-25.0		35	UD-4, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	
					40			35.0 - 37.0 ft: pitcher sample 35.0 - 45.0 ft: uniform drilling resistance, harder drilling from 36.0 to 45.0 ft (possibly from silt and sand), light olive brown drilling fluid, clumps of silty sand, fine sand and fine sand size highly weathered shells in cuttings
41.0	41.0 - 51.0 ft: SILTY SAND, fine to medium grained sand; wet, light olive gray, contains shells, weak HCl reaction	SM	-33.0		45	UD-5, UNDIST REC=23", 96%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	
					50			45.0 - 47.0 ft: pitcher sample 45.0 - 55.0 ft: uniform drilling resistance, smooth and easy drilling, light olive gray drilling fluid clumps of silty sand, fine to medium sand and fine to medium sand size fresh to medium sand size fresh to highly weathered shells in cuttings
51.0	51.0 - 62.0 ft: SILT WITH SAND, fine grained sand; moist, olive gray, contains shells, weak HCl reaction	ML	-43.0		55	UD-6, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	55.0 - 57.0 ft: pitcher sample

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773B** Contract Number: 06120048 Sheet: 3 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		ML			60			55.0 - 65.0 ft: uniform drilling resistance, smooth and easy drilling, olive gray drilling fluid, clumps of sandy silt, fine to medium sand and fine to medium size fresh to highly weathered shells in cuttings *(continued)*
62.0	62.0 - 71.0 ft: SILTY SAND, fine to medium grained sand; moist, olive gray, contains shells, weak HCl reaction	SM	-54.0		65	UD-7, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	65.0 - 67.0 ft: pitcher sample 65.0 - 75.0 ft: uniform drilling resistance, smooth and easy drilling, olive gray drilling fluid clumps of silty sand, fine to medium sand and fine to medium sand size fresh to moderately weathered shells in cuttings
					70			
71.0	71.0 - 91.0 ft: SANDY ELASTIC SILT, fine grained sand; moist, grayish green, contains mica, contains shells, weak HCl reaction	MH	-63.0		75	UD-8, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	75.0 - 77.0 ft: pitcher sample 75.0 - 85.0 ft: uniform drilling resistance, smooth and easy drilling, olive gray drilling fluid, clumps of sandy silt and fine sand in cuttings
					80			
					85	UD-9, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	85.0 - 87.0 ft: pitcher sample 85.0 - 95.0 ft: uniform drilling resistance, slightly harder drilling, olive gray drilling fluid, clumps of sandy silt and fine to medium sand cuttings
					90			
91.0	91.0 - 112.0 ft: SANDY SILT, fine grained sand; moist, dark grayish olive, contains mica, weak HCl reaction *(continued)*	ML	-83.0					

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773B** Contract Number: 06120048 Sheet: 4 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		ML			95	UD-10, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	95.0 - 97.0 ft: pitcher sample 95.0 - 105.0 ft: uniform drilling resistance, smooth and easy drilling, olive gray drilling fluid, clumps of sandy silt and fine to medium sand in cuttings
					100			
					105	UD-11, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	105.0 - 102.0 ft: pitcher sample 105.0 - 125.0 ft: uniform drilling resistance, smooth and easy drilling, olive gray drilling fluid, clumps of sandy silt and fine to medium sand in cuttings
					110			
112.0	112.0 - 150.0 ft: SILTY SAND, fine grained sand; moist, grayish green, contains mica, contains shells, weak HCl reaction (with shells), no HCl reaction (with soil)		-104.0					
		SM			115	UD-12, UNDIST REC=18", 75%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	115.0 - 125.0 ft: uniform drilling resistance, smooth and easy drilling, olive gray drilling fluid, clumps of sandy silt and fine to medium sand in cuttings
					120			
	125.0 ft: Changes to wet, no shells, weak HCl reaction				125	UD-13, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf	125.0 - 127.0 ft: pitcher sample

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-773B** Contract Number: 06120048 Sheet: 5 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
							PP > 4.50 tsf	125.0 - 135.0 ft: uniform drilling resistance, smooth and easy drilling, olive gray drilling fluid, clumps of sandy silt and fine to medium sand in cuttings *(continued)*
130								
135	135.0 ft: Changes to moist	SM				UD-14, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	135.0 - 137.0 ft: pitcher sample 135.0 - 145.0 ft: uniform drilling resistance, smooth and easy drilling, olive gray drilling fluid, clumps of silty sand and fine sand in cuttings
140								
145						UD-15, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	145.0 - 147.0 ft: pitcher sample 145.0 - 150.0 ft: uniform drilling resistance, smooth and easy drilling, olive gray and grayish green drilling fluid, clumps of silty sand and fine sand in cuttings
150.0			142.0		150			

Bottom of Boring at 150.0 ft.
Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-774** Contract Number: 06120048 Sheet: 1 of 12

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

North: 219196 ft **East:** 961000.5 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'	---
Start of Day	8/5	7:30 AM	8.5'	13.5'	---
Start of Day	8/6	7:25 AM	9.0'	13.5'	---
Casing Pulled	8/7	10:00 AM	8.5'	13.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	0.0 - 0.3 ft: Topsoil							
0.3	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	9.8			S-1, SPT 2+7+10 REC=15", 83%	MC = 20.4%	0.0 ft: advanced 6 1/4" ID HSA to 13.5 ft 0.0 - 2.5 ft: hard drilling significant rig chatter, brown and yellowish cuttings
2.0	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	8.1			S-2, SPT 6+10+9 REC=13", 72%		2.5 - 5.0 ft: uniform drilling resistance, smooth drilling, yellowish red cuttings
5.0	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 is quartzite at top of sample	FILL	5.1		5	S-3, SPT 8+9+7 REC=5", 28%		5.0 - 7.5 ft: very hard drilling, slow penetration rate, significant grinding, reddish brown cuttings
7.0	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	3.1			S-4, SPT 2+7+9 REC=11", 61%		7.5 - 10.0 ft: uniform drilling resistance, smooth drilling, light red cuttings
	9.5 ft: Changes to light red and light brown, interbeds sandy lean clay							

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-774** Contract Number: 06120048 Sheet: 2 of 12

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	interbeds, fine to medium sand, moist, light gray no HCl reaction, very soft (1 to 3 inch thick)	FILL				S-5, SPT 1+1+1 REC=9", 50%	LL = 24 PL = 14 MC = 17.9%	
11.5	11.5 - 13.4 ft: CLAYEY SAND, fine to coarse 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)	SC	-1.4			UD-1, UNDIST REC=19", 99%	LL = 22 PL = 12 MC = 17.6% 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 - 13.5 ft: at 13.4 ft, hard drilling with rig chatter
13.4	13.1 ft: Changes to estimated <5% shell fragments		-3.3			S-6, SPT 38+50/1.5" REC=7", 97%	LL = NP MC = 15.6%	13.1 - 13.4 ft: jar labeled as S-6A 13.4 - 13.7 ft: jar labeled as S-6B
	13.4 - 14.5 ft: SILTY SAND, fine to medium 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	SM						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 13.5 - 15.0 ft: very hard drilling with rig chatter, light brown drilling fluid
14.5		SM	-4.4		15	S-7, SPT 7+24+32 REC=14", 78%	LL = NP MC = 18.7%	
16.5	14.5 - 16.5 ft: SILTY SAND WITH GRAVEL, 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)	SP-SM	-6.4			UD-2, UNDIST REC=16.5", 69%	LL = 20 PL = 19 MC = 22.1% PP = 0.50 tsf PP = 0.50 tsf PP = 0.75 tsf	15.0 - 16.5 ft: very hard drilling with rig chatter, light grayish white drilling fluid 16.5 - 18.5 ft: pitcher sample (bottom 0.5 inch deformed) 16.5 - 20.0 ft: uniform drilling resistance, smooth drilling, light gray drilling fluid
18.5	16.5 - 18.5 ft: POORLY GRADED SAND WITH SILT AND GRAVEL, fine to coarse 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	-8.4			S-8, SPT 3+6+10 REC=11", 61%	LL = NP MC = 26.7%	
20.0	18.5 - 20.0 ft: SILTY SAND, fine to coarse grained sand; wet, gray with streaks of white, estimated 5 - 10% fine to coarse gravel, 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	-9.9		20	S-9, SPT 7+11+12 REC=11.5", 64%	LL = 28 PL = 23 MC = 34.6%	
21.5	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)	SC	-11.4			UD-3, UNDIST REC=23", 96%	LL = 30 PL = 19 MC = 23.3% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	21.5 - 23.5 ft: pitcher sample 21.5 - 25.0 ft: hard drilling with some chatter

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-774** Contract Number: 06120048 Sheet: 3 of 12

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
23.5	21.5 - 23.5 ft: CLAYEY SAND, 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 highy 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	-13.4			S-10, SPT 19+32+19 REC=14", 78%	LL = NP MC = 22.8%	21.5 - 25.0 ft: hard drilling with some chatter *(continued)*
25.0	23.5 - 25.0 ft: SILTY SAND, fine to medium grained sand; moist, gray with streaks of white, estimated 30 - 45% shell fragments, (highly to freshly weathered, medium sand to fine gravel size) est 30-45% cemented sand (cemented sand to fine gravel size), weak HCL reaction with soil, strong CHL reaction with shells, strong HCl reaction with cemented sand, weak to moderate cementation (some medium sand and all coarse sand and fine gravel are shell fragments or cemented sand)	SC-SM	-14.9		25	S-11, SPT 5+5+11 REC=17", 94%	LL = 30 PL = 23 MC = 34.7%	25.0 - 27.5 ft: uniform drilling resistance, smooth drilling, light brownish white drilling fluid
27.0	25.0 - 27.0 ft: SILTY, CLAYEY SAND, fine to medium grained sand; moist, grayish green with streaks of light brownish white, estimated 15 - 25% shell 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)		-16.9			S-12, SPT 2+3+2 REC=18", 100%	LL = 40 PL = 22 MC = 44.3%	
	27.0 - 35.0 ft: CLAYEY SAND, fine to medium 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 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, 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	SC			30	S-13, SPT 3+3+6 REC=17", 94%	LL = 36 PL = 21 MC = 34.5%	
						UD-4, UNDIST REC=23", 96%	LL = 42 PL = 22 MC = 31.2% PP = 3.50 tsf PP = 3.50 tsf PP = 4.00 tsf	31.5 - 33.5 ft: pitcher sample
						S-14, SPT 6+7+11 REC=18", 100%	LL = 30 PL = 25 MC = 37.4%	
35.0	33.5 ft: Changes to grayish green with speckles of white, estimated <5% shell fragments, medium sand sized highly to moderatly weathered shell fragments		-24.9		35	S-15, SPT 4+6+8 REC=18", 100%	LL = 37 PL = 24 MC = 37.6%	
	35.0 - 37.0 ft: SILTY SAND, fine to medium grained sand; moist, grayish green, contains mica, no HCl reaction, homogenous structure	SM						

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-774** Contract Number: 06120048 Sheet: 4 of 12

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
37.0	37.0 - 39.5 ft: SANDY ELASTIC SILT, 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)	MH	-26.9			S-16, SPT 4+7+10 REC=18", 100%	LL = 82 PL = 51 MC = 59.4%	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	39.5 - 41.5 ft: CLAYEY SAND, fine to medium grained sand; moist, grayish green, contains mica, homogenous structure, no to weak HCl reaction	SC	-29.4		40	S-17, SPT 4+5+7 REC=18", 100%	LL = 75 PL = 31 MC = 46.4%	
41.5	41.5 - 49.5 ft: CLAYEY 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)	SC	-31.4			UD-5, UNDIST REC=24", 100%	LL = 56 PL = 19 MC = 38.2% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	41.5 - 43.5 ft: pitcher sample
	43.5 ft: Changes to with speckles of light brownish white, contains mica, weak HCl reaction (with soil) 44.3 ft: Changes to estimated 5 - 10% shell fragments, medium to coarse sand sized moderately to highly weathered shell fragments					S-18, SPT 4+7+11 REC=18", 100%	LL = 46 PL = 23 MC = 45.7%	
	45.0 ft: Changes to estimated <5% shell fragments				45	S-19, SPT 4+6+8 REC=18", 100%	LL = 57 PL = 22 MC = 47.1%	
	47.5 ft: Changes to fine to medium grained sand; grayish green with streaks of white, estimated 5 - 10% shell fragments, white shell fragments, highly weathered to fresh shell fragments					S-20, SPT 2+4+4 REC=18", 100%	LL = NP MC = 31.9%	
49.5	49.5 - 51.5 ft: SILTY SAND, fine to coarse grained sand; grayish green with speckles of white, estimated <5% fine gravel, estimated 15 - 25% shell fragments, highly to freshly weathered,	SM	-39.4		50	S-21, SPT 4+5+10	LL = NP MC = 34.3%	

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-774** Contract Number: 06120048 Sheet: 5 of 12

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	medium sand to fine gravel size shell fragments, contiaining mica, weak HCl reaction (with soil), strong HCl reaction (with shells)	SM				REC=18", 100%		
51.5	51.5 - 57.0 ft: FAT CLAY, fine grained sand; moist, grayish green with speckles of white, estimated 5 - 10% shell fragments, contains mica, strong HCl reaction, white shell fragments, medium to coarse sand sized highly weathered to fresh shell fragments	CH	-41.4			UD-6, UNDIST REC=24", 100%	LL = 63 PL = 20 MC = 39.2% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	51.5 - 53.5 ft: pitcher sample
	53.5 ft: Changes to greenish green with speckles of white, estimated <5% shell fragments, white shell fragments, 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, smooth drilling, gray drilling fluid
	55.0 ft: Changes to grayish green with streaks of light brownish white, estimated 5 - 10% shell fragments, light brownish white shell fragments, moderately to highly weathered shell fragments, weak HCl reaction (with soil)				55	S-23, SPT 4+5+7 REC=18", 100%		
57.0	57.0 - 62.0 ft: SANDY ELASTIC SILT, fine grained sand; moist, grayish green, contains mica, weak HCl reaction, hard, homogenous structure	MH	-46.9			S-24, SPT 4+5+8		
	60.0 ft: Changes to strong HCl reaction				60	S-25, SPT 4+6+8 REC=18", 100%		
62.0	62.0 - 67.0 ft: SILTY SAND, fine to medium grained sand; moist, olive gray with speckles of white, estimated <5% shell fragments, contains mica, white shell fragments, medium to coarse sand sized highly to moderately weathered shell fragments, strong HCl reaction with shells, weak HCl reaction with soil	SM	-51.9			S-26, SPT 3+5+6 REC=18", 100%		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-774** Contract Number: 06120048 Sheet: 6 of 12

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	65.0 ft: Changes to olive gray with streaks of white, estimated 15 - 25% shell fragments, highly weathered to fresh shell fragments	SM			65	S-27, SPT 3+3+4 REC=18", 100%		
67.0	67.0 - 75.4 ft: SILTY SAND, fine grained sand; moist, olive gray, contains mica, weak HCl reaction, homogenous structure		-56.9			S-28, SPT 3+4+7 REC=18", 100%		67.5 - 70.0 ft: grayish green drilling fluid
		SM			70	S-29, SPT 3+5+6 REC=18", 100%		70.0 - 72.5 ft: gray drilling fluid
						S-30, SPT 4+5+8 REC=18", 100%		
75.4	75.4 - 79.5 ft: ELASTIC SILT, fine grained sand; moist, grayish green, contains mica, weak HCl reaction, hard	MH	-65.3		75	S-31, SPT 4+5+7 REC=18", 100%		75.0 - 75.4 ft: jar labeled as S-31A 75.4 - 76.5 ft: jar labeled as S-31B

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-774** Contract Number: 06120048 Sheet: 7 of 12

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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 FAT CLAY, fine grained sand; moist, grayish green, contains mica, weak HCl reaction, hard, homogenous structure	CH	-71.4			UD-7, UNDIST REC=22", 92%	LL = 136 PL = 38 MC = 68.9% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	81.5 ft: swiched 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 81.5 - 83.5 ft: pitcher sample 83.5 - 85.0 ft: switched to 3-1/2" tricone roller bit; uniform resistance, smooth drilling, gray drilling fluid
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%		
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% 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%		

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-774** Contract Number: 06120048 Sheet: 8 of 12

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		MH						
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, hard, homogenous structure	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	95.7 - 101.5 ft: SILTY SAND, fine grained sand; moist, grayish green, contains mica, weak HCl reaction		-85.6					95.7 - 96.5 ft: jar labeled as S-39B
	97.5 ft: Changes to olive gray, homogenous structure	SM				S-40, SPT 5+6+8 REC=18", 100%		97.5 - 100.0 ft: dark greenish gray drilling fluid
					100	S-41, SPT 5+8+10 REC=18", 100%		
101.5	101.5 - 103.5 ft: SANDY FAT CLAY, fine grained sand; moist, olive gray, contains mica, weak HCl reaction, homogenous structure	CH	-91.4			UD-8, UNDIST REC=24", 100%	LL = 94 PL = 24 MC = 46.0% 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: pitcher sample
103.5	103.5 - 105.0 ft: SANDY SILT, fine grained sand; moist, olive gray, contains mica, weak HCl reaction, homogenous structure	ML	-93.4			S-42, SPT 4+12+13 REC=18", 100%		103.5 ft: switched to 3 1/2" OD tricone roller bit and advanced to

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-774** Contract Number: 06120048 Sheet: 9 of 12

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		ML						111.5 ft, uniform drilling resistance, smooth drilling, grayish green drilling fluid 105.0 - 107.5 ft: 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%		107.5 - 110.0 ft: light olive 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		110	S-45, SPT 5+7+9 REC=18", 100%		
111.5	111.5 - 113.5 ft: SANDY FAT CLAY, fine grained sand; moist, grayish green, contains mica, weak HCl reaction	CH	-101.4			UD-9, UNDIST REC=23", 96%	LL = 131 PL = 29 MC = 94.5% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	111.5 - 113.5 ft: pitcher sample
113.5	113.5 - 115.0 ft: SILTY SAND, fine to medium grained sand; moist, olive gray, contains mica, weak HCl reaction, homogenous structure 114.5 ft: Changes to olive gray with streaks of light brownish white, estimated <5% shell fragments, light brownish white shells, highly weathered shell fragments	SM	-103.4			S-46, SPT 4+5+7 REC=18", 100%		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 drilling fluid 115.0 ft: switched to 6" OD tricone roller bit, reamed borehole from 101.5 to 121.5 ft
115.0	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	-104.9		115	S-47, SPT 2+5+6 REC=16", 89%		
117.5	117.5 - 121.5 ft: SILTY SAND, fine to medium grained sand; wet, olive gray *(continued)*	SM	-107.4			S-48, SPT 4+5+9		

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-774** Contract Number: 06120048 Sheet: 10 of 12

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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)	SM				REC=12", 67%		117.5 - 120.0 ft: light olive gray drilling fluid *(continued)*
	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				120	S-49, SPT 2+3+7 REC=17", 94%		
121.5	121.5 - 140.0 ft: CLAYEY 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		-111.4			UD-10, UNDIST REC=18", 75%	LL = 42 PL = 25 MC = 33.9% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	121.5 - 123.5 ft: pitcher sample
						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
	125.0 ft: Changes to fine grained sand; homogenous structure	SC			125	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%		
					130	S-53, SPT 4+4+6 REC=18", 100%		

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-774** Contract Number: 06120048 Sheet: 11 of 12

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
						UD-11, UNDIST REC=22.5", 94%	LL = 70 PL = 24 MC = 36.3% 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: pitcher sample
						S-54, SPT 6+7+8 REC=0", 0%		
		SC			135	S-55, SPT 3+6+9 REC=0", 0%		135.0 - 137.5 ft: sampler basket was inverted, possibly due to suction pulling sample back out of spoon
						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 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
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		140	S-57, SPT 4+8+12 REC=18", 100%		
141.5	141.5 - 150.0 ft: SANDY FAT CLAY, fine grained sand; moist, grayish green, contains mica, weak HCl reaction, hard	CH	-131.4			UD-12, UNDIST REC=20", 83%	LL = 90 PL = 24 MC = 50.0% PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	141.5 - 143.5 ft: pitcher sample
	143.5 ft: Changes to homogenous structure					S-58, SPT 8+9+12 REC=18", 100%		

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-774** Contract Number: 06120048 Sheet: 12 of 12

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		CH			145	S-59, SPT 5+9+12 REC=18", 100%		
						S-60, SPT 6+9+11 REC=18", 100%		
150.0			-139.9		150			

Bottom of Boring at 150.0 ft.
Boring backfilled with cement/bentonite grout upon completion.

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: pitcher sample

143.5 ft: Switched to 3 1/2" OD tricone roller bit and advanced to 150.0 ft

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

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-775** Contract Number: 06120048 Sheet: 1 of 8

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

North: 219105.3 ft **East:** 961091.5 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'	---
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	SAMPLING DATA	TESTS	REMARKS
0.2	0.0 - 0.2 ft: Topsoil; organics, grass		9.5					
	0.2 - 2.0 ft: FILL, sampled as poorly graded sand with gravel, fine to coarse grained sand, subrounded particles; moist, brown, estimated <5% crushed stone, no HCl reaction, rounded fine gravel	FILL				S-1, SPT 4+4+13 REC=11", 61%	MC = 4.3%	0.0 - 2.5 ft: advanced 4 1/4" ID HSA to 9 ft; bit chatter from 0 to 0.8 ft; brown cuttings
2.0	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	7.7			S-2, SPT 3+6+6 REC=14", 78%	LL = 27 PL = 16 MC = 13.8%	2.5 - 5.0 ft: uniform drilling resistance, gray cuttings at 3 ft
4.5	4.5 - 7.0 ft: SILTY SAND, fine to coarse grained sand, subrounded to subangular particles; moist, brownish orange, estimated 5 - 10% fine gravel, no HCl reaction, subrounded gravel	SM	5.2		5	S-3, SPT 3+12+14 REC=16", 89%	MC = 7.9%	5.0 ft: orangish brown cuttings
7.0	7.0 - 10.5 ft: CLAYEY SAND, fine to coarse grained sand, subrounded to subangular particles; wet, estimated <5% clay, no HCl reaction	SC	2.7			S-4, SPT WOH+1/12" REC=13", 72%	MC = 17.1%	7.5 - 9.0 ft: switch to 3 1/2" OD tricone roller bit (mud rotary) and advanced to 100 ft 7.5 - 10.0 ft: Uniform drilling resistance, smooth drilling, brown drilling fluid

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-775** Contract Number: 06120048 Sheet: 2 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SC				S-5, SPT 3+4+2 REC=11", 61%	MC = 19.6%	
10.5	10.5 - 12.0 ft: POORLY GRADED SAND, medium to coarse grained sand, subrounded particles; wet, light brown, no HCl reaction	SP	-0.8					
12.0	12.0 - 14.5 ft: POORLY GRADED SAND WITH SILT AND GRAVEL, 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-SM	-2.3			S-6, SPT 5+9+13 REC=12", 67%	MC = 19.2%	13.0 ft: bit chatter, gray drilling fluid
14.5	14.5 - 17.0 ft: SILTY SAND, fine to coarse 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	-4.8		15	S-7, SPT 12+44+50/3" REC=14", 93%	MC = 19.9%	15.0 - 17.5 ft: uniform drilling resistance, smooth drilling
17.0	17.0 - 19.5 ft: CLAYEY SAND, fine to coarse grained sand; wet, dark gray, estimated 5 - 10% 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	SC	-7.3			S-8, SPT 14+7+6 REC=18", 100%	LL = 27 PL = 17 MC = 31.0%	18.5 - 19.5 ft: bit chatter
19.5	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	-9.8		20	S-9, SPT 3+5+8 REC=15", 83%	MC = 29.0%	20.0 - 98.5 ft: uniform drilling resistance, smooth drilling
	22.5 ft: Changes to coarse sand to fine gravel size fresh to highly weathered shell fragments					S-10, SPT 4+4+12 REC=18", 100%	LL = NP MC = 33.2%	

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-775** Contract Number: 06120048 Sheet: 3 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP-SM						20.0 - 98.5 ft: uniform drilling resistance, smooth drilling *(continued)*
24.5	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	-14.8		25	S-11, SPT 11+2+5 REC=17", 94%	MC = 29.1%	
27.0	27.0 - 29.5 ft: CLAYEY SAND, fine to coarse 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)	SC	-17.3			S-12, SPT 4+5+9 REC=18", 100%	LL = 34 PL = 23 MC = 36.2%	
29.5	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	-19.8		30	S-13, SPT 4+19+25 REC=18", 100%	MC = 24.6%	
32.0	32.0 - 34.5 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand; wet, dark gray, estimated <5% gravel, estimated <5% shell fragments, weak HCl reaction, coarse sand to fine gravel size moderately weathered shell fragments	SP-SM	-22.3			S-14, SPT 3+5+8 REC=18", 100%	MC = 41.4%	32.5 - 35.0 ft: Uniform drilling resistance, smooth drilling
34.5	34.5 - 37.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand; wet, olive gray, estimated <5% shell fragments, no HCl reaction, coarse sand size moderately weathered shell fragments	SP-SM	-24.8		35	S-15, SPT 5+6+8 REC=18", 100%	MC = 41.2%	

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-775** Contract Number: 06120048 Sheet: 4 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
37.0	37.0 - 39.5 ft: SILTY SAND, fine to medium 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)	SM	-27.3			S-16, SPT 5+6+8 REC=18", 100%	MC = 39.9%	20.0 - 98.5 ft: uniform drilling resistance, smooth drilling *(continued)*
39.5	39.5 - 42.0 ft: SILTY 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%	MC = 59.9%	
42.0	42.0 - 44.5 ft: SILTY SAND, 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), no HCl reaction (with soil)	SM	-32.3			S-18, SPT 5+7+8 REC=18", 100%	MC = 43.9%	
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%	MC = 39.1%	
47.0	47.0 - 49.5 ft: SILTY 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%	MC = 42.3%	
49.5	49.5 - 52.0 ft: CLAYEY SAND, fine grained sand; moist, olive gray, contains mica, estimated <5% shell fragments, coarse sand to fine gravel size moderately weathered shell fragments, *(continued)*	SC	-39.8		50	S-21, SPT 4+5+7	LL = 42 PL = 25	

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-775** Contract Number: 06120048 Sheet: 5 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	strong HCl reaction (with shells), weak HCl reaction (with soil)	SC				REC=16", 89%	MC = 34.5%	20.0 - 98.5 ft: uniform drilling resistance, smooth drilling *(continued)*
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%	MC = 31.0%	
54.5	54.5 - 59.5 ft: SILTY SAND, fine grained sand; moist, olive gray, contains mica, estimated <5% shell fragments, strong HCl reaction, coarse sand size highly weathered shell fragment	SM	-44.8		55	S-23, SPT 5+7+9 REC=18", 100%	MC = 34.8%	
	57.5 ft: Changes to estimated <5% shell fragments					S-24, SPT 5+8+11 REC=18", 100%	MC = 44.0%	
59.5	59.5 - 64.5 ft: SANDY FAT CLAY, 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)	CH	-49.8		60	S-25, SPT 6+9+12 REC=18", 100%	LL = 64 PL = 28 MC = 46.7%	
						S-26, SPT 8+10+10 REC=18", 100%	LL = 84 PL = 35 MC = 58.5%	

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-775** Contract Number: 06120048 Sheet: 6 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		CH						20.0 - 98.5 ft: uniform drilling resistance, smooth drilling *(continued)*
64.5	64.5 - 67.0 ft: SANDY LEAN CLAY, 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)	CL	-54.8		65	S-27, SPT 5+7+9 REC=18", 100%	LL = 44 PL = 25 MC = 44.2%	
67.0	67.0 - 77.0 ft: SILTY SAND, fine grained sand; moist, olive gray, estimated <5% shell fragments, strong HCl reaction		-57.3			S-28, SPT 5+6+9 REC=18", 100%	MC = 39.6%	
	70.0 ft: Changes to weak HCl reaction				70	S-29, SPT 5+7+9 REC=18", 100%	MC = 40.9%	
		SM				S-30, SPT 6+8+9 REC=18", 100%	MC = 42.2%	
					75	S-31, SPT 5+8+7 REC=18", 100%	MC = 49.8%	
77.0	77.0 - 98.5 ft: ELASTIC SILT; moist, olive gray, contains mica, weak HCl reaction, *(continued)*	MH	-67.3					

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-775** Contract Number: 06120048 Sheet: 7 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	firm					S-32, SPT 7+8+10 REC=18", 100%	LL = 90 PL = 38 MC = 66.2%	20.0 - 98.5 ft: uniform drilling resistance, smooth drilling *(continued)*
					80	S-33, SPT 8+9+10 REC=18", 100%	MC = 74.0%	
						S-34, SPT 7+10+12 REC=18", 100%	MC = 72.8%	
		MH						
					85	S-35, SPT 8+10+11 REC=18", 100%	LL = 118 PL = 48 MC = 75.8%	
						S-36, SPT 7+8+10 REC=18", 100%	MC = 66.8%	
					90	S-37, SPT 7+9+11 REC=18", 100%	MC = 63.9%	

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-775** Contract Number: 06120048 Sheet: 8 of 8

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
								20.0 - 98.5 ft: uniform drilling resistance, smooth drilling *(continued)*
						S-38, SPT 7+10+12 REC=18", 100%	LL = 110 PL = 50 MC = 67.1%	
		MH			95	S-39, SPT 9+12+13 REC=18", 100%	MC = 76.1%	
98.5	98.5 - 100.0 ft: SANDY FAT CLAY, fine grained sand; moist, contains mica, weak HCl reaction	CH	-88.8			S-40, SPT 9+9+11 REC=18", 100%	LL = 54 PL = 24 MC = 41.5%	
100.0			-90.3		100			

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

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-776** Contract Number: 06120048 Sheet: 1 of 2

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

North: 219143 ft **East:** 961053.7 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	SAMPLING DATA	TESTS	REMARKS
	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				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
2.0			7.6					
	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	S-3, SPT 6+12+8 REC=13", 72%		5.0 - 7.5 ft: rig chatter at 6.0 ft, brown and gray cuttings
	5.0 ft: Changes to medium to coarse grained sand, subrounded particles; brown, estimated <5% fine gravel, estimated <5% crushed stone, no HCl reaction							
7.0			2.6					
	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			0.1					
	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			10	S-5, SPT 3+1+2 REC=14", 78%		
12.5			-2.9					
	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			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. 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.
17.5			-7.9					
	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	SP-SM			20	S-7, SPT 6+6+11 REC=16", 89%		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					S-8, SPT 20+12+11 REC=18", 100%		

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-776** Contract Number: 06120048 Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		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		30	S-9, SPT 13+50/2" REC=8", 100%		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		35	S-10, SPT 5+8+9 REC=18", 100%		33.5 - 36.5 ft: Uniform drilling resistance, smooth drilling
36.0	36.0 - 38.3 ft: SILT; moist, olive gray	ML	-26.4			UD-1, UNDIST REC=20", 93%		36.5 - 38.3 ft: Shelby tube, no pocket penontrometer readings could be taken due to damaged tube.
38.3	38.3 - 42.5 ft: SANDY SILT, fine grained sand; moist, olive gray, contains mica, no HCl reaction	ML	-28.7		40	S-11, SPT 4+8+11 REC=18", 100%		
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		45	S-12, SPT 5+7+10 REC=18", 100%		
	46.5 ft: Changes to contains shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)					UD-2, UNDIST REC=16", 103%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	46.5 - 47.8 ft: Shelby tube
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		50	S-13, SPT 4+5+7 REC=17", 94% S-14, SPT 6+6+10 REC=18", 100%		47.5 - 50.0 ft: Uniform drilling resistance, greenish gray drilling fluid
51.5	50.0 ft: Changes to estimated 5 - 10% shell fragments, fresh to moderately weathered shell fragments, strong HCl reaction (wih shells), weak HCl reaction (with soil)		-41.9					

Bottom of Boring at 51.5 ft.
Boring backfilled with bentonite and cement grout using tremie pipe upon completion.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-778** Contract Number: 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,
6-1/2" O.D. Tri-cone roller bit

Hammer Type: Auto Hammer (140 lb)

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

North: 219075 ft **East:** 960739.6 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 113.6 (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 DEPTH	SAMPLING DATA	TESTS	REMARKS
0.4	0.0 - 0.4 ft: Rootmat and topsoil		113.2					0.0 ft: advanced 6 1/4" ID HSA to 10 ft
	0.4 - 2.0 ft: SANDY SILT, fine to medium grained sand; moist, light brown, no HCl reaction, soft	ML				S-1, SPT 1+4+6 REC=17", 94%		0.0 - 2.5 ft: uniform drilling resistance, smooth drilling, orangish brown cuttings
2.0	2.0 - 13.5 ft: CLAYEY SAND, fine to medium grained sand; moist, orangish brown, no HCl reaction		111.6			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%	MC = 13.0%	
	6.5 ft: Changes to light orangish brown	SC				UD-1, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	6.5 - 8.5 ft: shelby tube 6.5 - 10.0 ft: brought the bottom of augers up to 9 ft to switch to mud rotary
						S-4, SPT 6+9+11 REC=13", 72%	MC = 5.9%	
	10.0 ft: Changes to orangish brown with bands of light gray				10	S-5, SPT 11+11+11 REC=18", 100%	MC = 6.1%	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 ft: Changes to light orangish brown, lensed, 0.25 inch pockets of LEAN CLAY (CL)					UD-2, UNDIST REC=24", 100%	LL = 27 PL = 14 MC = 23.2% PP = 0.75 tsf PP = 1.00 tsf PP = 0.75 tsf MC = 23.5%	11.5 - 13.5 ft: pitcher sample
13.5	13.5 - 21.0 ft: POORLY GRADED SAND, fine to coarse 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)		100.1			S-6, SPT 6+8+9 REC=12", 67%		
		SP			15			13.5 - 18.5 ft: uniform drilling resistance, smooth drilling, brown drilling fluid
	18.5 ft: Changes to fine to medium grained sand; 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%	MC = 3.9%	
					20			
21.0	21.0 - 23.5 ft: SILTY SAND, fine to medium grained sand; moist, orangish brown, estimated <5% fine gravel, no HCl reaction	SM	92.6			UD-3, UNDIST REC=11", 46%		21.5 - 23.5 ft: pitcher sample, tube not preserved, jar sample taken and labeled UD-3
23.5	23.5 - 25.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand; moist, orangish brown, no HCl reaction	SP-SM	90.1			UD-4, UNDIST REC=12", 50%		23.5 ft: flush hole

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-778** Contract Number: 06120048 Sheet: 2 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
25.5	25.5 - 28.0 ft: SILTY SAND, fine to medium grained sand; moist, orangish brown, no HCl reaction	SP-SM SM	88.1			S-8, SPT 3+5+8 REC=10", 56%	MC = 18.4%	to remove cuttings 23.5 - 25.5 ft: pitcher sample, tube not preserved, jar sample taken and labeled as UD-4 *(continued)*
28.0	28.0 - 38.0 ft: SILTY SAND, fine to medium 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		85.6		30	S-9, SPT 6+5+5 REC=13", 72%	MC = 16.5%	
	31.5 ft: Changes to orangish brown	SM				UD-5, UNDIST REC=12", 50%		31.5 - 33.5 ft: pitcher sample, tube not preserved, jar sample taken and labeled as UD-5
					35	UD-6, UNDIST REC=10.5", 44%	LL = NP MC = 15.1% PP = 1.00 tsf PP = 1.00 tsf PP = 1.00 tsf MC = 21.9%	33.5 - 35.5 ft: pitcher sample
	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					S-10, SPT 6+7+7 REC=11", 61%		
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	75.6			S-11, SPT 2+2+3 REC=17", 94%	LL = 36 PL = 19 MC = 29.5% LL = 38 PL = 19 MC = 31.3%	38.5 - 39.0 ft: jar labeled as S-11A 39.0 - 40.0 ft: jar labeled as S-11B
39.1	39.1 - 43.5 ft: CLAYEY SAND, fine grained sand; moist, dark gray, contains mica, no HCl reaction, soft	SC	74.5		40	UD-7, UNDIST REC=19", 79%	LL = 39 PL = 15 MC = 26.6% PP = 1.25 tsf PP = 1.75 tsf PP = 1.50 tsf LL = NP MC = 33.8%	41.5 - 43.5 ft: pitcher sample
43.5	43.5 - 47.5 ft: SILTY SAND, fine to medium grained sand; wet, dark gray, contains mica, no HCl reaction	SM	70.1		45	S-12, SPT 1+2+3 REC=14", 78%		
47.5	47.5 - 51.0 ft: FAT CLAY; moist, dark gray, contains mica, no HCl reaction, firm, contains a 2 inch layer of POORLY GRADED SAND (SP), fine to medium sand, wet, dark gray at 48.8 ft, contains a 0.5 inch layer of POORLY GRADED SAND (SP), fine to medium sand, wet, dark gray at 49.1 ft	CH	66.1		50	S-13, SPT 2+4+6 REC=18", 100%	LL = 63 PL = 30 MC = 36.9%	48.5 - 51.5 ft: grayish brown drilling fluid
51.0	51.0 - 53.5 ft: SANDY SILT, fine to coarse grained sand; moist, dark gray, contains mica, no HCl reaction, firm	ML	62.6			UD-8, UNDIST REC=24", 100%	LL = NP MC = 32.3% PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	51.5 - 58.5 ft: gray drilling fluid 51.5 - 53.5 ft: pitcher sample
53.5	53.5 - 61.5 ft: SILTY SAND, fine grained sand; moist, dark, contains mica, no HCl reaction	SM	60.1		55	S-14, SPT 6+7+9 REC=17", 94%		

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-778** Contract Number: 06120048 Sheet: 3 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	58.5 ft: Changes to olive gray	SM			60	S-15, SPT 6+6+8 REC=15", 83%		
61.5	61.5 - 63.5 ft: FAT CLAY; moist, dark gray, estimated <5% fine to medium sand, no HCl reaction, strong cementation	CH	52.1			UD-9, UNDIST REC=24", 100%	LL = 50 PL = 17 MC = 23.7% PP = 4.50 tsf	61.5 - 63.5 ft: pitcher sample
63.5	63.5 - 67.5 ft: CLAYEY SAND WITH GRAVEL, fine to coarse grained sand; moist, dark gray, fine gravel, no HCl reaction, strong cementation, gravel as cemented sand	SC	50.1		65	S-16, SPT 50/4" REC=4", 100%	PP = 4.50 tsf PP = 4.50 tsf MC = 21.5%	63.5 - 68.5 ft: bit chatter, hard, slow drilling from 63 ft to 64 ft
67.5	67.5 - 77.5 ft: SANDY FAT CLAY, fine to medium grained sand; moist, olive gray, contains mica, no HCl reaction, soft	CH	46.1		70	S-17, SPT 2+2+3 REC=18", 100%	LL = 54 PL = 22 MC = 37.1%	68.5 - 71.5 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid
	73.5 ft: Changes to fine grained sand				75	UD-10, UNDIST REC=24", 100% S-18, SPT 4+5+5 REC=18", 100%	LL = 66 PL = 18 MC = 48.2% PP = 2.50 tsf PP = 2.25 tsf PP = 2.25 tsf	71.5 - 73.5 ft: pitcher sample
77.5	77.5 - 86.0 ft: SANDY LEAN CLAY, fine grained sand; moist, olive gray, contains mica, no HCl reaction	CL	36.1		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				85	UD-11, UNDIST REC=24", 100% S-20, SPT 6+9+15 REC=18", 100%	LL = 46 PL = 20 MC = 28.1% PP = 4.50 tsf PP = 4.50 tsf PP = 4.00 tsf	81.5 - 83.5 ft: pitcher sample 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	27.6					
87.5	87.5 - 91.5 ft: SILTY SAND, fine to coarse 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	26.1		90	S-21, SPT 17+20+22 REC=14", 78%	MC = 22.0%	
91.5	91.5 - 93.5 ft: POORLY GRADED GRAVEL; moist, olive gray, estimated *(continued)*	GP	22.1			UD-12, UNDIST REC=12", 50%	PP = 4.50 tsf	91.5 ft: flushed hole with drilling

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-778** Contract Number: 06120048 Sheet: 4 of 5

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
93.5	<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	20.1			UD-13, UNDIST REC=14", 58%	PP = 4.50 tsf PP = 4.50 tsf PP = 0.00 tsf PP = 0.50 tsf PP = 0.50 tsf	fluid to remove cuttings 91.5 - 93.5 ft: pitcher sample, 3" hard layer at 92.5 ft encountered during push, tube not preserved, jar sample taken and labeled UD-12 *(continued)* 91.5 - 93.5 ft: rig chatter from 92.5 to 92.8 ft, olive gray drilling fluid *(continued)* 93.5 - 95.5 ft: pitcher sample 98.5 - 101.5 ft: bit chatter/hard, slow drilling from 99.7 to 100.2 ft 101.5 - 103.5 ft: pitcher sample 101.5 - 103.5 ft: hammer energy testing not conducted below 100 ft for this rig/hammer/rod system
95.5	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	18.1		95	S-22, SPT 12+19+22 REC=12", 67%	MC = 21.9%	
97.5	95.5 - 97.5 ft: SILTY SAND, fine to coarse grained sand; moist, olive gray, contains mica, estimated 5 - 10% fine gravel, estimated 5 - 10% shell fragments, coarse sand to fine gravel size fresh shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	16.1		100	S-23, SPT 19+22+50/3" REC=10", 67%	MC = 21.0%	
103.5	97.5 - 103.5 ft: CLAYEY SAND, fine to coarse grained sand; moist, olive gray, estimated 5 - 10% fine gravel, estimated 5 - 10% shell fragments, coarse sand sized, moderately weathered shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil) 101.5 ft: Changes to NO GRAVEL, fine to medium grained sand	SC	10.1		105	UD-14, UNDIST REC=20", 83% S-24, SPT 11+11+18 REC=13", 72%	LL = 28 PL = 20 MC = 25.1% PP = 0.00 tsf PP = 0.50 tsf PP = 0.25 tsf	
111.0	103.5 - 111.0 ft: SILTY 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) 108.5 ft: Changes to fine grained sand, coarse sand size highly weathered shell fragments, weak HCl reaction (with soil)	SM	2.6		110	S-25, SPT 6+8+11 REC=18", 100%	MC = 31.8%	
117.5	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) 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	-3.9		115	UD-15, UNDIST REC=24", 100% S-26, SPT 10+16+21 REC=18", 100%	PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	111.5 - 113.5 ft: pitcher sample 113.5 - 118.5 ft: switched to 3-1/2" OD tricone roler bit and advanced to 121.5 ft; 113.5 -118.5 ft interval: smooth drillig, olive gray drilling fluid
119.5	117.5 - 119.5 ft: SILTY SAND, fine to coarse 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	-5.9		120	S-27, SPT 50/6" REC=5", 83% S-28, SPT 20+12+22 REC=17", 94%	MC = 21.1% MC = 23.5%	118.5 - 120.0 ft: bit chatter/hard drilling from 118.5 to 119.5 ft, olive gray drilling fluid
121.5	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	-7.9					

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-778** Contract Number: 06120048 Sheet: 5 of 5

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

Bottom of Boring at 121.5 ft.
Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-779** Contract Number: 06120048 Sheet: 1 of 4

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

North: 218941.1 ft **East:** 960604.8 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	SAMPLING DATA	TESTS	REMARKS
0.4	0.0 - 0.4 ft: ORGANIC SOIL		100.4					
	0.4 - 2.0 ft: SILT; moist, light brown, no HCl reaction, firm	ML				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.
2.0	2.0 - 4.5 ft: SANDY SILT, fine grained sand; moist, orangish brown, no HCl reaction, firm	ML	98.8			S-2, SPT 5+5+7 REC=18", 100%		
4.5	4.5 - 8.3 ft: SILTY SAND, fine to coarse grained sand, subrounded particles; moist, light yellowish brown, no HCl reaction 6.5 ft: Changes to orangish brown	SM	96.3		5	S-3, SPT 4+5+5 REC=18", 100%	MC = 3.6%	
						UD-1, UNDIST REC=21", 98%	LL = NP MC = 9.5% PP = 0.75 tsf PP = 0.75 tsf PP = 0.75 tsf	6.5 - 8.3 ft: Shelby tube
8.3	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	92.5			S-4, SPT 10+13+21 REC=18", 100%		
9.9		SP	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		89.3			UD-2, UNDIST REC=24", 100%	LL = NP MC = 17.0% PP = 1.75 tsf PP = 2.00 tsf PP = 2.75 tsf MC = 10.0%	
	11.5 - 17.0 ft: SILTY SAND, fine to coarse grained sand, subrounded to subangular particles; moist, orangish brown, no HCl reaction 13.5 ft: Changes to orangish brown and light gray, estimated <5% fine gravel, 0.25 to 0.5 inch pockets of LEAN CLAY (CL)	SM			15	S-6, SPT 7+11+9 REC=17", 94%		11.5 - 13.5 ft: pitcher sample 11.5 ft: uniform drilling resistance, smooth drilling
17.0			83.8					
	17.0 - 21.0 ft: SILTY SAND, fine grained sand; moist, light orangish brown, no HCl reaction	SM			20	S-7, SPT 6+5+6 REC=14", 78%	MC = 8.7%	
21.0	21.0 - 23.5 ft: SILTY SAND, fine grained sand; moist, orangish brown and light gray, no HCl reaction	SM	79.8			UD-3, UNDIST REC=24", 100%	LL = NP MC = 24.5% PP = 1.50 tsf PP = 1.00 tsf PP = 1.25 tsf	21.5 - 23.5 ft: pitcher sample
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%	LL = 32 PL = 18	

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-779** Contract Number: 06120048 Sheet: 2 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SC					MC = 19.1%	
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
31.5	31.5 - 33.5 ft: CLAYEY SAND, fine grained sand; moist, dark gray, contains mica, no HCl reaction	SC	69.3			UD-4, UNDIST REC=24", 100%	LL = 32 PL = 19 MC = 26.7% PP = 2.50 tsf PP = 3.00 tsf PP = 2.50 tsf	29.1 - 30.0 ft: jar labeled at S-9B 31.5 ft: Flush hole with drilling fluid to clear cuttings 31.5 - 33.5 ft: pitcher sample
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%	LL = 58 PL = 30 MC = 38.0%	
	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: FAT CLAY; moist, dark gray, contains mica, estimated 5 - 10% fine to medium sand, no HCl reaction	CH	59.8			UD-5, UNDIST REC=24", 100%	LL = 69 PL = 19 MC = 22.7% PP = 3.25 tsf PP = 4.25 tsf PP = 4.25 tsf	41.5 - 43.5 ft: pitcher sample 41.5 - 48.5 ft: gray drilling fluid, removed cuttings from mud tub with a shovel
					45	S-12, SPT 3+7+11 REC=15", 83%		
					50	S-13, SPT 5+6+8 REC=18", 100%		
51.0	51.0 - 53.5 ft: SILTY GRAVEL, fine gravel; moist, olive gray, contains mica, estimated 50 - 100% fine gravel, fine gravel as cemented or sand soil)	GM	49.8			UD-6, UNDIST REC=12", 50%		51.5 - 53.5 ft: pitcher sample, hard pushing at 52.5 ft, broke through hard material at 53.1 ft, tube not preserved, jar sample taken, (labeled as UD-6) 51.5 ft: Increased drilling resistance, rig chatter, slow drilling from 52.5 to 53.1 ft, gray
53.5	53.5 - 58.0 ft: CLAYEY SAND, fine grained sand; moist, olive gray, contains mica, no HCl reaction	SC	47.3		55	UD-7, UNDIST REC=24", 100% S-14, SPT 2+4+4 REC=18", 100%	LL = 40 PL = 20 MC = 30.1% PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	
58.0	58.0 - 71.0 ft: SANDY FAT CLAY, fine	CH	42.8					

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-779** Contract Number: 06120048 Sheet: 3 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	grained sand; moist, olive gray, contains mica, no HCl reaction, firm	CH			60	S-15, SPT 3+3+3 REC=18", 100%	MC = 40.1%	drilling fluid 53.5 ft: pitcher sample 53.5 - 58.5 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid 61.5 - 63.5 ft: pitcher sample
						UD-8, UNDIST REC=24", 100%	LL = 68 PL = 19 MC = 42.3% PP = 3.75 tsf PP = 3.25 tsf PP = 3.50 tsf	
					65	S-16, SPT 3+5+5 REC=18", 100%		
					70	S-17, SPT 5+5+8 REC=18", 100%	MC = 39.2%	
71.0	71.0 - 77.0 ft: SANDY FAT CLAY, 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 73.5 ft: Changes to fine to coarse grained sand; estimated <5% shell fragments, moderate cementation, coarse sand to fine gravel size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	CH	29.8			UD-9, UNDIST REC=22", 92%	LL = 51 PL = 20 MC = 34.2% PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf MC = 36.7%	71.5 ft: pitcher sample 74.0 ft: bit chatter/increased drilling resistance
					75	S-18, SPT 10+25+50/2" REC=13", 93%		
77.0	77.0 - 83.5 ft: SILTY, CLAYEY SAND, fine to coarse grained sand; moist, olive gray, contains mica, estimated 5 - 10% shell fragments, estimated <5% fine gravel, 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) 81.5 ft: Changes to wet, olive brown, contains shell fragments, highly weathered shell fragments, strong HCl reaction (with shells and soil)	SC-SM	23.8		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
						UD-10, UNDIST REC=16", 70%	LL = 26 PL = 19 MC = 23.0% PP = 0.50 tsf PP = 0.75 tsf PP = 0.50 tsf MC = 22.4%	81.5 - 83.4 ft: pitcher sample, hard drilling/pushing at 83.1 ft, too hard to push further
83.5	83.5 - 87.0 ft: SILTY SAND, fine to coarse 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)	SM	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
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 - 96.5 ft: POORLY GRADED SAND WITH SILT	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

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-779** Contract Number: 06120048 Sheet: 4 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP-SM			95	S-22, SPT 4+4+6 REC=17", 94%		
96.5	96.5 - 98.5 ft: CLAYEY SAND, 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)	SC	4.3			UD-11, UNDIST REC=14", 58%	LL = 32 PL = 20 MC = 27.0% PP = 1.00 tsf PP = 1.00 tsf PP = 1.50 tsf MC = 34.6%	96.5 - 98.5 ft: pitcher sample resistance increased hard/slow drilling/pushing at 97.5 to 97.8 ft
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), no HCl reaction (with soil)	SP-SM	2.3			S-23, SPT 4+5+8 REC=18", 100%		
100.0		SC	0.8		100	UD-12, UNDIST REC=24", 100%	LL = 39 PL = 17 MC = 28.3% PP = 4.50 tsf PP = 4.50 tsf PP = 4.50 tsf	100.0 - 102.0 ft: pitcher sample
102.0	100.0 - 102.0 ft: CLAYEY SAND, fine to medium grained sand; moist, olive gray, estimated <5% fine gravel, contains mica, contains shell fragments, coarse sand size, moderately weathered shell fragments, weak HCl reaction (with shells), weak HCl reaction (with soil)		-1.2					

Bottom of Boring at 102.0 ft.
Boring backfilled with cement/bentonite grout upon completion.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-780** Contract Number: 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

North: 219546.2 ft **East:** 960610 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	SAMPLING DATA	TESTS	REMARKS
0.5	0.0 - 0.5 ft: Topsoil; organics, grass		9.2			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 2.5 - 5.0 ft: rig chatter, light gray cuttings with pieces of concrete
2.0	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	7.7			S-2, SPT 50/1" REC=1", 100%		
4.0	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	5.7		5	S-3, SPT 50/3" REC=3", 100%		
6.0	4.0 - 6.0 ft: FILL, sampled as sandy silt with gravel; moist, light gray, no HCl reaction, (disintegrated concrete)	FILL	3.7					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

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 COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-780A** Contract Number: 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

North: 219542.4 ft **East:** 960604.1 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 9.2 (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 DEPTH	SAMPLING DATA	TESTS	REMARKS
	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	FILL			5	S-1, SS 2+2+4 REC=6", 33%		0.0 ft: Material description and USCS symbols are based on observations made at B-780 and auger cuttings. 0.0 ft: These descriptions, symbols and boundaries provide a general indication of material changes with depth, but do not represent detailed conditions. Refer to B-780 of the investiagation for more detailed descriptions. 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. 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
8.0			1.2					

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

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-780B** Contract Number: 06120048 Sheet: 1 of 2

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

North: 219532.9 ft **East:** 960625.2 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 9.2 (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	SAMPLING DATA	TESTS	REMARKS
	0.0 - 2.0 ft: FILL, sampled as silty sand with gravel	FILL						0.0 ft: Material descriptions and USCS symbolsto a depth of 5 ft are based on observations made at B-780 and auger cuttings. 0.0 ft: These descriptions, symbols and boundaries provide a general indication of material changes with depth, but do not represent detailed conditions. Refer to B-780 of the 2008 investigation for more detailed descriptions. 0.0 ft: advanced 4 1/4" ID HSA to 14.5 ft 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 - 10.0 ft: no recovery due to cohesionless soil, poorly graded sand cuttings, uniform drilling resistance, smooth drilling, brown cuttings 12.0 - 13.0 ft: bit chatter 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
2.0	2.0 - 4.0 ft: FILL, sampled as silty gravel with sand	FILL	7.2					
4.0	4.0 - 7.5 ft: FILL, sampled as sandy silt with gravel	FILL	5.2		5			
7.5	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	1.7		10	S-1, SPT 3+3+2 REC=0", 0% S-2, SPT 3+2+2 REC=11", 61%		
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	-2.8		15	S-3, SPT 12+6+8 REC=16", 89%		
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 cemented sands), no HCl reaction (with soil)	SP	-7.8		20	S-4, SPT 9+9+10 REC=15", 83%		
22.0	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	SP-SM	-12.8			S-5, SPT 17+6+10 REC=17", 94%		

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-780B** Contract Number: 06120048 Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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						drilling fluid 14.5 ft: uniform drilling, smooth drilling, gray drilling fluid
27.5			-18.3					
	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			30	S-6, SPT 27+16+15 REC=18", 100%		28.5 - 33.5 ft: olive gray drilling fluid
32.0			-22.8					
	32.0 - 37.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand; moist, olive gray, contains mica, no HCl reaction	SP-SM			35	S-7, SPT 4+7+10 REC=18", 100%		
37.0			-27.8					
	37.0 - 42.5 ft: SANDY SILT, fine grained sand; moist, olive gray, contains mica, weak HCl reaction, firm	ML			40	S-8, SPT 7+9+9 REC=18", 75%		38.5 - 40.0 ft: uniform drilling resistance, smooth drilling
42.5			-33.3					
	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			45	S-9, SPT 7+9+12 REC=18", 100%		
47.5			-38.3					
	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)	SP-SM			50	S-10, SPT 7+8+11 REC=18", 100%		
50.0			-40.8					

Bottom of Boring at 50.0 ft.
Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-781** Contract Number: 06120048 Sheet: 1 of 2

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

North: 219400.9 ft **East:** 960780.8 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	SAMPLING DATA	TESTS	REMARKS
	0.0 - 2.0 ft: FILL, sampled as poorly graded sand with silt and gravel, fine to coarse grained sand; moist, gray and light brown, estimated 30 - 45% crushed stone, no HCl reaction	FILL				S-1, SPT 14+20+22 REC=15", 83%	MC = 9.9%	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 2.5 - 5.0 ft: uniform drilling resistance, smooth drilling, brown cuttings
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	8.4			S-2, SPT 3+18+11 REC=12", 67%	MC = 6.6%	
4.5	4.5 - 9.5 ft: FILL, sampled as clayey sand, fine to medium grained sand, subrounded particles; moist, orangish brown, no HCl reaction 7.5 ft: Changes to estimated <5% crushed stone	FILL	5.9		5	S-3, SPT 4+5+3 REC=12", 67%	LL = 24 PL = 15 MC = 13.8%	
						S-4, SPT 2+2+2 REC=9", 50%	MC = 15.6%	
9.5	9.5 - 12.5 ft: FILL, sampled as sandy clay, medium grained sand; wet, orangish brown, no HCl reaction, soft	FILL	0.9		10	S-5, SPT 1+1+1 REC=4", 22%	MC = 16.5%	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	-2.1		15	S-6, SPT 1+2+2 REC=11", 61%	LL = NP MC = 25.1%	12.5 - 14.0 ft: photograph shows incorrect depth should be 13.5 - 15.0 ft 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, gray drilling fluid
17.0	17.0 - 22.0 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, subrounded particles; wet, dark gray, estimated 5 - 10% fine gravel, 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	-6.6		20	S-7, SPT 4+5+6 REC=16", 89%	MC = 26.3%	
22.0	22.0 - 26.5 ft: SILTY SAND, fine to coarse 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	SM	-11.6			S-8, SPT 8+20+13 REC=18", 100%	LL = NP MC = 27.0%	

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-781** Contract Number: 06120048 Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	to fine gravel size moderately to highly weathered shell fragments	SM						
26.5	26.5 - 32.0 ft: SILTY, CLAYEY SAND, fine to coarse grained sand; moist, dark gray, estimated 5 - 10% fine gravel, estimated <5% shell fragments, strong HCl reaction, moderate cementation, fine gravel as cementation sand, coarse sand to fine grained size, highly weathered shell fragments	SC-SM	-16.1		30	S-9, SPT 5+9+50/4" REC=16", 100%	LL = 28 PL = 22 MC = 22.7%	28.5 - 48.5 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: ELASTIC SILT; moist, olive gray, contains mica, estimated <5% fine grained sand, weak HCl reaction, firm	MH	-26.6		40	S-11, SPT 6+8+9 REC=18", 100%	LL = 83 PL = 36 MC = 58.5%	
42.0	42.0 - 47.0 ft: CLAYEY 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)	SC	-31.6		45	S-12, SPT 4+6+10 REC=18", 100%	LL = 46 PL = 23 MC = 40.6%	
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	S-13, SPT 3+6+9 REC=18", 100%	LL = NP MC = 36.9%	
50.0			-39.6					

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

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-782** Contract Number: 06120048 Sheet: 1 of 2

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

North: 218936.5 ft **East:** 961232.1 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	SAMPLING DATA	TESTS	REMARKS
	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 - 10% fine gravel, no HCl reaction	FILL				S-1, SPT 11+13+13 REC=14", 78%	MC = 7.4%	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 2.5 - 5.0 ft: brown cuttings
2.0			7.9					
	2.0 - 4.5 ft: FILL, sampled as silty sand, fine to coarse grained sand, subangular particles; moist, reddish brown and dark gray, estimated <5% shell fragments, coarse sand size fresh shell fragments; strong HCl reaction (with shells), no HCl reaction (with soil)	FILL				S-2, SPT 1+3+4 REC=12", 67%	MC = 13.8%	
4.5			5.4					
		FILL			5	S-3, SPT 4+10+9 REC=14", 78%	MC = 4.3%	
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	SM	2.9			S-4, SPT 2+8+8 REC=13", 72%	MC = 14.1%	
9.5	7.0 - 9.5 ft: SILTY SAND, medium to coarse grained sand, rounded to subrounded particles; wet, orangish brown, no HCl reaction	SP-SM	0.4		10	S-5, SPT 2+2+3 REC=13", 72%	MC = 17.8%	10.0 - 13.5 ft: orangish brown cuttings
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)		-2.6			S-6, SPT 2+5+3 REC=13", 72%	MC = 28.0%	13.5 - 14.5 ft: brown cuttings 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 14.5 - 18.5 ft: bit chatter at 17.5 ft, gray drilling fluid
	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			15			
17.5			-7.6					
	17.5 - 22.0 ft: POORLY GRADED 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%	MC = 22.1%	
22.0			-12.1					
	22.0 - 32.0 ft: SILTY SAND, fine to medium 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	SM				S-8, SPT 3+5+8 REC=17", 94%	MC = 34.9%	

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-782** Contract Number: 06120048 Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	(with soil)	SM				UD-1, UNDIST REC=0"		26.5 ft: shelby tube push attempted; tube did not penetrate the soil, no sample recovered, no jar sample taken, tube not preserved 28.5 - 33.5 ft: greenish gray drilling fluid
					30	S-9, SPT 4+6+9 REC=18", 100%		
32.0	32.0 - 37.0 ft: SILTY SAND, fine to coarse 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%	MC = 35.2%	
37.0	37.0 - 42.0 ft: SILTY SAND, fine to medium 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)	SM	-27.1					
					40	S-11, SPT 5+7+10 REC=18", 100%	MC = 40.3%	38.5 - 43.5 ft: uniform drilling resistance, smooth drilling, greenish gray drilling fluid
42.0	42.0 - 46.5 ft: SILTY SAND, fine to medium 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)	SM	-32.1					
					45	S-12, SPT 6+8+9 REC=18", 100%	MC = 43.4%	
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: shelby tube
47.3	47.3 - 51.5 ft: POORLY GRADED SAND WITH CLAY, 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-SC	-37.4			S-13, SPT 4+8+12 REC=18", 100%	LL = 45 PL = 23 MC = 51.2%	
					50	S-14, SPT 4+7+9 REC=18", 100%	LL = NP MC = 41.9%	
51.5	50.0 ft: Changes to fine gravel size fresh to moderately weathered shell fragments; strong HCl reaction (with shells), weak HCl reaction (with soil)		-41.6					

Bottom of Boring at 51.5 ft.
Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-785** Contract Number: 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: 8/22/08 **Finished:** 8/22/08

North: 218155.9 ft **East:** 960637.4 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 98.1 (ft) **Total Depth:** 70.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	8/22	1:15 PM	38.5'	14.5'	---
Completion	8/22	2:00 PM	6.8'	14.5'	70.0'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	0.0 - 2.0 ft: SANDY SILT, fine grained sand; moist, brown, contains mica, contains roots, no HCl reaction, soft	ML				S-1, SPT 1/12"+1 REC=11", 85%		0.0 - 2.5 ft: advanced 4 1/4" ID HSA to 14.5 ft 0.0 - 2.5 ft: uniform drilling resistance, smooth drilling, light brown cuttings, used pilot bit to clear augers 2.5 - 5.0 ft: orangish brown cuttings
2.0	2.0 - 7.0 ft: SANDY SILT, fine grained sand; moist, orangish brown, no HCl reaction, firm	ML	96.1			S-2, SPT 4+9+8 REC=11", 61%		
	5.0 ft: Changes to contains roots				5	S-3, SPT 10+12+13 REC=17", 94%		
7.0	7.0 - 27.0 ft: POORLY GRADED SAND, fine to coarse grained sand, subangular to rounded particles; moist, orangish brown, estimated <5% fine gravel, no HCl reaction	SP	91.1			S-4, SPT 8+9+13 REC=16", 89%		
	10.0 ft: Changes to medium grained sand, subrounded particles; no gravel				10	S-5, SPT 10+13+15 REC=18", 100%		
	13.5 ft: Changes to fine to coarse grained sand					S-6, SPT 6+12+14 REC=16", 89%		14.5 ft: switch to 3 1/2" OD tricone roller bit (mud rotary) and advanced to 70.0 ft, mixed one bag of bentonite with 125 gallons of water to make drilling fluid 14.5 - 18.5 ft: uniform drilling resistance, smooth drilling, brown drilling fluid
					15			
	18.5 ft: Changes to fine to medium grained sand					S-7, SPT 10+11+12 REC=13", 72%		
					20			
						S-8, SPT 15+18+22 REC=16", 89%		

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-785** Contract Number: 06120048 Sheet: 2 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP						23.5 - 28.5 ft: uniform drilling resistance, smooth drilling, brown drilling fluid *(continued)*
27.0	27.0 - 32.5 ft: SANDY LEAN CLAY, fine grained sand; moist, orangish brown and light gray, no HCl reaction, soft	CL	71.1		30	S-9, SPT 2+2+3 REC=18", 100%		
32.5	32.5 - 37.5 ft: LEAN CLAY WITH SAND, fine grained sand; moist, dark gray, contains mica, no HCl reaction, soft	CL	65.6		35	S-10, SPT 2+3+5 REC=18", 100%		33.5 - 38.5 ft: grayish brown drilling fluid
37.5	37.5 - 47.5 ft: FAT CLAY; moist, gray, no HCl reaction, soft, contains a 4-inch layer of POORLY GRADED SAND (SP), fine sand, wet 38.6 ft: Changes to dark gray 43.5 ft: Changes to contains mica, firm	CH	60.6		40 45	S-11, SPT 7+5+6 REC=18", 100% S-12, SPT 4+6+7 REC=18", 100%	LL = 66 PL = 31 MC = 35.9%	43.5 - 58.5 ft: uniform drilling resisitance, smooth drilling, gray drilling fluid
47.5	47.5 - 52.5 ft: SANDY LEAN CLAY, fine to medium grained sand; moist, dark gray, no HCl reaction	CL	50.6		50	S-13, SPT 3+5+8 REC=17", 94%	LL = 41 PL = 19 MC = 33.1%	
52.5	52.5 - 57.5 ft: SILTY SAND, fine to coarse grained sand; moist, reddish brown, no HCl reaction, weak cementation, containes iron cemented sand	SM	45.6		55	S-14, SPT 5+9+13 REC=15", 83%	MC = 30.9%	
57.5	57.5 - 62.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand; *(continued)*	SP-SM	40.6					

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-785** Contract Number: 06120048 Sheet: 3 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	light brown and orangish brown, no HCl reaction	SP-SM			60	S-15, SPT 24+25+27 REC=11", 61%	MC = 10.6%	58.5 - 63.5 ft: uniform drilling resistance, smooth drilling, light brown drilling fluid *(continued)*
62.5	62.5 - 67.5 ft: LEAN CLAY; moist, dark gray, contains mica, weak HCl reaction, firm	CL	35.6		65	S-16, SPT 3+5+5 REC=18", 100%	MC = 43.4%	63.5 - 68.5 ft: gray drilling fluid
67.5	67.5 - 70.0 ft: SANDY LEAN CLAY, fine grained sand; moist, dark gray, contains mica, estimated <5% shell fragments, coarse sand size moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	CL	30.6		70	S-17, SPT 5+7+8 REC=18", 100%	LL = 49 PL = 24 MC = 38.1%	
70.0			28.1					

Bottom of Boring at 70.0 ft.
Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-786** Contract Number: 06120048 Sheet: 1 of 1

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

Hammer Type: Auto Hammer (140 lb)

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

North: 217943.5 ft **East:** 960500.5 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 62.0 (ft) **Total Depth:** 11.5 ft

Groundwater Observations

Date	Time	Depth	Casing	Caved

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	0.0 - 2.0 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand; dry, light orangish brown, contains roots	SP-SM				S-1, SPT 1+2+5 REC=13", 72%	MC = 0.5%	0.0 ft: advanced 4 1/4 ID HSA to 11.5 ft 0.0 - 2.5 ft: uniform drilling resistance, smooth drilling, light orangish brown cuttings, 12" root mat, decaying leaves and organics exposed on excavated bench sidewall
2.0	2.0 - 9.5 ft: SILTY SAND, fine to coarse grained sand; dry, light orangish brown, estimated <5% fine gravel, contains roots	SM	60.0			S-2, SPT 5+9+8 REC=14", 78%	MC = 8.1%	
	5.0 ft: Changes to fine to medium grained sand; no gravel				5	S-3, SPT 6+9+9 REC=15", 125%	MC = 6.2%	
	7.5 ft: Changes to fine to coarse grained sand; orangish brown, no HCl reaction, coarse sand subrounded					S-4, SPT 11+29+25 REC=18", 100%	MC = 4.4%	7.5 - 10.0 ft: orangish brown cuttings
9.5	9.5 - 11.5 ft: FAT CLAY, fine grained sand; moist, orangish brown with mottles of grayish white, estimated <5% fine grained sand, no HCl reaction, firm	CH	52.5		10	S-5, SPT 2+3+3 REC=13", 72%	LL = 68 PL = 32 MC = 28.7%	
11.5			50.5					

Bottom of Boring at 11.5 ft.
Hole abandoned at 11.5 ft due to rig shifting position into the loose sands
Upon auger removal, boring sidewalls collapsed (caved) to surface

NOTE: Boring drilled on excavated bench (drill pad), drilling pad excavated approximately 1 ft deep

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-786A** Contract Number: 06120048 Sheet: 1 of 3

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: 8/20/08 **Finished:** 8/20/08

North: 217943.2 ft **East:** 960496.4 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 62.1 (ft) **Total Depth:** 80.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered ▽	8/20	11:00 AM	15.0'	13.5'	---
Completion ▼	8/20	3:45 PM	64.0'	33.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	0.0 - 2.0 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand	SP-SM						0.0 - 11.5 ft: Material descriptions and USCS symbols (to a depth of 10 ft) are based on B-786 of the 2008 investigation. These descriptions, symbols and boundaries provide a general indication of material changes with depth but, 0.0 ft: do not represent detailed conditions. Refer to B-786 details for more detailed material descriptions in this area.
2.0	2.0 - 9.5 ft: SILTY SAND, fine to coarse grained sand; estimated <5% fine gravel		60.1					
	5.0 ft: Changes to fine to medium grained sand; no gravel	SM			5			
	7.5 ft: Changes to fine to coarse grained sand							
9.5	9.5 - 11.5 ft: FAT CLAY, fine grained sand	CH	52.6		10			
11.5	11.5 - 19.3 ft: SILTY SAND, fine to coarse grained sand; moist, grayish orange, no HCl reaction		50.6					0.0 - 13.5 ft: advanced 4 1/4" ID HSA to 13.5 ft, uniform drilling resistance, smooth drilling
	▽	SM			15	S-1, SPT 3+6+8 REC=18", 100%	MC = 19.9%	13.5 ft: switched to 3 1/4" OD tricone roller bit (mud rotary) and advanced to 17.0 ft
19.3	18.5 ft: Changes to light orangish gray with bands of dark orange, iron oxidation band, contains 0.1 ft layer of silty sand at 18.8 ft, gray		42.8		20	S-2, SPT 2+12+17 REC=18", 100%	MC = 27.9% MC = 27.1%	13.5 - 17.0 ft: uniform drilling resistance, smooth drilling, gray drilling fluid, mud tub HSA coupling seal leakage occurred; significant fluid loss through seal; switched to 4 1/4" ID HSA and reamed from 13.5 to 17.0 ft
	19.3 - 22.5 ft: SILTY SAND, fine to coarse grained sand; moist, dark orangish brown, estimated 5 - 10% cemented sands, dark orangish brown iron	SM						
22.5	22.5 - 27.0 ft: POORLY GRADED SAND, fine to medium grained sand; wet, yellowish brown, estimated <5% silt, no HCl reaction	SP	39.6			S-3, SPT 8+16+33 REC=16", 89%	MC = 17.8%	17.0 ft: advanced HSA to 33.5 ft 17.0 - 18.5 ft: light orangish gray

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-786A** Contract Number: 06120048 Sheet: 2 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP						drilling fluid 18.5 - 23.5 ft: yellowish brown cuttings 18.5 - 19.3 ft: jar labeled as S-2A
27.0	27.0 - 31.5 ft: FAT CLAY, fine grained sand; moist, gray, contains mica, weak HCl reaction, firm, homogenous structure	CH	35.1		30	S-4, SPT 3+4+4 REC=18", 100%	LL = 75 PL = 33 MC = 47.6%	19.3 - 20.0 ft: jar labeled as S-2B 23.5 - 28.5 ft: gray cuttings *(continued)*
31.5	31.5 - 37.5 ft: LEAN CLAY WITH SAND, fine grained sand; moist, gray, contains mica, estimated <5% shell fragments, weak HCl reaction (with shells and soils) hard, homogeneous structure	CL	30.6		35	S-5, SPT 3+5+6 REC=18", 100%	LL = 48 PL = 24 MC = 41.1%	33.5 ft: switched to 3 1/4" OD tricone roller bit and advanced to 80.0 ft 33.5 - 38.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
37.5	37.5 - 43.5 ft: SILTY SAND, fine to coarse grained sand; moist, gray, contains mica, estimated 5 - 10% cemented sands, estimated <5% shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SM	24.6		40	S-6, SPT 4+12+50/2" REC=14", 97%	MC = 34.6%	38.5 - 41.0 ft: uniform drilling resistance 41.0 - 43.0 ft: hard drilling
43.5	43.5 - 47.5 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand; wet, gray, estimated 15 - 25% shell fragments, contains mica, fresh to highly weathered shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	18.6		45	S-7, SPT 14+13+21 REC=18", 100%		43.0 - 43.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid
47.5	47.5 - 67.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand; wet, gray, estimated 15 - 25% shell fragments, contains mica, fresh to highly shell fragments, weak HCl reaction (with shells), no HCl reaction (with soil)	SP-SM	14.6		50	S-8, SPT 5+5+9 REC=18", 100%		48.5 - 53.5 ft: uniform drilling resistance, smooth drilling, moderate bit chatter from 53.0 to 53.5 ft
	53.5 ft: Changes to estimated <5% shell fragments, highly weathered shell fragments				55	S-9, SPT 5+5+7 REC=18", 100%		53.5 - 58.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-786A** Contract Number: 06120048 Sheet: 3 of 3

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP-SM			60	S-10, SPT 2+5+6 REC=18", 100%		
					65	S-11, SPT 3+5+5 REC=18", 100%		63.5 - 67.0 ft: uniform drilling resistance, smooth drilling 63.5 ft: lost 250 gallons of drilling fluid between 50.0 to 68.5 ft
67.0	67.0 - 73.0 ft: POORLY GRADED SAND WITH SILT AND GRAVEL, fine to medium grained sand; wet, light gray, estimated 15 - 25% shell fragments, contains mica, fine gravel, highly weathered shell fragments, subangular fine gravel as cemented shell fragments, weak HCl reaction (with shells and soil)	SP-SM	-4.9		70	S-12, SPT 30+21+12 REC=18", 100%		67.0 - 71.0 ft: slight bit chatter 71.0 - 73.0 ft: uniform drilling resistance, smooth drilling
73.0	73.0 - 80.0 ft: POORLY GRADED SAND WITH SILT, fine to medium 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	-10.9		75	S-13, SPT 10+16+20 REC=13", 72%		73.0 - 73.5 ft: bit chatter 73.5 ft: lost 75 gallons of additional drilling fluid between ~ 68.5 - 80.0 ft 73.5 - 75.5 ft: uniform drilling resistance, smooth drilling
	78.5 ft: Changes to estimated <5% shell fragments, weak reaction (with soil)				80	S-14, SPT 6+8+13 REC=18", 100%		75.5 - 76.5 ft: slight bit chatter 76.5 - 78.5 ft: uniform drilling resistance, smooth drilling
80.0			-17.9					

Bottom of Boring at 80.0 ft.
Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-786B** Contract Number: 06120048 Sheet: 1 of 4

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: K. Bell

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

Method: 6" O.D. Tri-cone Roller Bit

Hammer Type: Auto Hammer (140 lb)

Dates Started: 11/6/08 **Finished:** 11/10/08

North: 217914.6 ft **East:** 960460.7 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 54.2 (ft) **Total Depth:** 115.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	11/6	2:04 PM	5.0'	---	---
Start of Day	11/7	6:45 AM	1.0'	---	---
Start of Day	11/10	8:00 AM	12.0'	---	---
Completion	11/10	11:00 AM	1.0'	---	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	0.0 - 11.0 ft: CLAYEY SAND, fine to coarse grained sand, subrounded particles; wet, orangish brown, no HCl reaction	SC			5	UD-1, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	0.0 ft: Material descriptions and USCS symbols are based on observations of cutting contained in drilling fluid and limited UD samples where available. 0.0 ft: These descriptions, symbols and boundaries provide a general indication of material changes with depth, but do not represent detialed conditions. 0.0 ft: Refer to B-786 of the 2008 investigation for more detailed material descriptions in this area. 0.0 ft: driller mixed 1 bag of bentonite with 100 gallons of water to make drilling fluid
					10			
11.0	11.0 - 21.0 ft: POORLY GRADED SAND, fine to medium grained sand; wet, light yellowish brown, contains mica, no HCl reaction	SP	43.2		15	UD-2, UNDIST REC=18", 75%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	0.0 - 5.0 ft: advanced 6.0" OD tricone roller bit (mud rotary) to 115.0 ft; uniform drilling resistance, smooth and easy drilling, light brown drilling fluid 5.0 - 15.0 ft: orangish brown drilling fluid
					20			
21.0	21.0 - 31.0 ft: SANDY SILT, fine grained sand; moist, olive gray, contains shells, weak HCl reaction (with shells and soil)	ML	33.2					15.0 - 17.0 ft: pitcher sample 15.0 - 25.0 ft: slightly harder drilling, uniform drilling resistance, orangish brown drilling fluid

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-786B** Contract Number: 06120048 Sheet: 2 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		ML				UD-3, UNDIST REC=12", 50%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	25.0 - 27.0 ft: pitcher sample 25.0 - 27.0 ft: uniform drilling resistance, smooth drilling, orangish brown drilling fluid
						UD-4, UNDIST REC=21", 88%	PP = 4.00 tsf PP = 3.50 tsf PP = 3.50 tsf	27.0 - 29.0 ft: pitcher sample 27.0 - 30.0 ft: light brown drilling fluid
					30			30.0 - 35.0 ft: light gray drilling fluid 30.0 - 31.0 ft: smooth drilling
31.0	31.0 - 41.0 ft: SILTY SAND, fine to medium grained sand; wet, contains shells, weak HCl reaction (with shells and soil)	SM	23.2					31.0 - 32.5 ft: slight rig chatter 32.5 - 34.5 ft: very hard drilling with rig chatter
					35	UD-5, UNDIST REC=20", 83%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	34.5 - 35.0 ft: possible cemented sand, smooth and easy drilling 35.0 - 37.0 ft: pitcher sample 35.0 - 45.0 ft: uniform drilling resistance, slight rig chatter from 40.0 to 41.0 ft (possible cemented sand), light olive gray drilling fluid; clumps of sand, silt, fine to medium sand and fine to coarse sand size angular fresh to highly weathered shells in cuttings
					40			
41.0	41.0 - 64.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand; wet, olive gray, contains shells, weak HCl reaction (with shells), no HCl reaction (with soil)		13.2					
					45	UD-6, UNDIST REC=18", 75%	PP = 3.50 tsf PP = 3.50 tsf PP = 4.00 tsf	45.0 - 47.0 ft: pitcher sample 45.0 - 55.0 ft: uniform drilling resistance, smooth and easy drilling, light olive gray drilling fluid
		SP-SM			50			
	55.0 ft: Changes to light olive gray				55	UD-7, UNDIST REC=24", 100%	PP = 4.00 tsf PP = 4.50 tsf PP = 4.00 tsf	55.0 - 57.0 ft: pitcher sample

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-786B** Contract Number: 06120048 Sheet: 3 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP-SM			60			55.0 - 65.0 ft: uniform drilling resistance, slight rig chatter and harder drilling from 61.5 ft to 64.0 ft (possible cemented sand), smooth drilling from 64.0 to 65.0 ft, light olive gray drilling fluid *(continued)*
64.0	64.0 - 71.0 ft: POORLY GRADED SAND WITH SILT AND GRAVEL, fine to medium grained sand; wet, light gray, contains fine gravel, contains shells, weak to strong HCl reaction (with shells and soil), subrounded fine gravel as cemented sand	SP-SM	-9.8		65	UD-8, UNDIST REC=22", 92%	PP = 2.00 tsf PP = 2.50 tsf PP = 2.00 tsf	65.0 - 67.0 ft: pitcher sample 65.0 - 75.0 ft: uniform drilling resistance, light gray drilling fluid, poorly graded sand, fine to medium sand and fine to medium sand size fresh to moderately weathered shells in cuttings
					70			
71.0	71.0 - 84.0 ft: SILTY SAND, fine to medium grained sand; wet, light olive gray, contains fine gravel, contains shells, fine gravel as cemented sand, weak HCl reaction (with shells and soil), strong cementation (fine gravel)	SM	-16.8					72.0 - 73.0 ft: slightly harder drilling, rig chatter (possible cemented sand),
					75	UD-9, UNDIST REC=21", 88%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	75.0 - 77.0 ft: pitcher sample 75.0 - 84.0 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid
					80			
84.0	84.0 - 91.0 ft: SANDY SILT, fine grained sand; moist, olive gray, contains mica, weak HCl reaction	ML	-29.8		85	UD-10, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	84.0 ft: driller added 1 bag of bentonite to thicken drilling fluid 84.0 - 85.0 ft: uniform drilling resistance, smooth and easy drilling, gray drilling fluid
					90			85.0 - 87.0 ft: pitcher sample
91.0	91.0 - 115.0 ft: SILTY SAND, fine to medium grained sand; wet, grayish olive, contains shells, weak to strong HCl *(continued)*	SM	-36.8					

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-786B** Contract Number: 06120048 Sheet: 4 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	reaction (with shells and soil)	SM			95 100 105 110 115	UD-11, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	85.0 - 95.0 ft: uniform drilling resistance, harder drilling, drilling rate slowed, light gray drilling fluid, silty sand, fine to medium sand and fine to medium sand size, fresh to moderately weathered shells in cuttings *(continued)* 95.0 - 97.0 ft: pitcher sample 95.0 - 115.0 ft: uniform drilling resistance, smooth and easy drilling, olive gray drilling fluid, clumps of silty sand, fine to medium sand and fine to medium sand size fresh to moderately weathered shells in cuttings
115.0			-60.8					

Bottom of Boring at 115.0 ft.
Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-787** Contract Number: 06120048 Sheet: 1 of 4

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

North: 217780.9 ft **East:** 960598.1 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 49.4 (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	SAMPLING DATA	TESTS	REMARKS
	0.0 - 2.0 ft: FILL, sampled as silty sand, fine to coarse grained sand; moist, orangish brown with mottles of light gray, no HCl reaction	FILL				S-1, SPT 1+4+3 REC=13", 72%	MC = 14.5%	0.0 ft: advanced 4 1/4" ID HSA to 19.5 ft 0.0 - 2.5 ft: uniform resistance, smooth drilling, brown cuttings
2.0	2.0 - 4.5 ft: FILL, sampled as clayey sand, fine to coarse grained sand; moist, orangish brown with mottles of light gray, no HCl reaction	FILL	47.4			S-2, SPT 2+3+4 REC=13", 72%	MC = 7.9%	
4.5	4.5 - 7.0 ft: FILL, sampled as sandy lean clay, fine to medium grained sand; moist, orangish brown with mottles of gray, no HCl reaction	FILL	44.9		5	S-3, SPT 1+2+3 REC=10", 56%	MC = 24.2%	
7.0	7.0 - 9.5 ft: FILL, sampled as silty sand, fine to coarse 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	42.4			S-4, SPT 1+3+5 REC=13", 72%	MC = 15.2%	
9.5	9.5 - 14.2 ft: FILL, sampled as silty sand, fine to coarse grained sand; moist, orangish brown with bands of light gray, no HCl reaction, moderate cementation	FILL	39.9		10	S-5, SPT 3+6+7 REC=17", 94%	MC = 14.7%	
14.2	14.2 - 17.5 ft: FILL, sampled as clayey sand, fine to coarse grained sand; moist, gray, contains 0.25 inch layer of iron cemented sands at 14.8 ft	FILL	35.2		15	S-6, SPT 2+2+3 REC=18", 100%	MC = 13.4% MC = 22.9%	13.5 - 14.2 ft: jar labeled as S-6A 14.2 - 15.0 ft: jar labeled as S-6B
17.5	17.5 - 22.5 ft: POORLY GRADED SAND, medium to coarse grained sand, subrounded particles; wet, brown with bands of brownish red, estimated <5% fine gravel, no HCl reaction, weak cementation, fine gravel as iron cemented sands	SP	31.9		20	S-7, SPT 2+4+5 REC=17", 94%	MC = 24.1%	19.5 ft: switched 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	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	ML	26.9			S-8, SPT 3+4+5 REC=18", 100%		19.5 - 23.5 ft: uniform drilling

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-787** Contract Number: 06120048 Sheet: 2 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	shells), no HCl reaction (with soil)	ML						resistance, smooth drilling, grayish brown drilling fluid 23.5 - 28.5 ft: gray 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	21.9		30	S-9, SPT 3+4+9 REC=18", 100%		
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	17.4		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	11.9		40	S-11, SPT 4+6+8 REC=17", 94%		42.0 - 43.0 ft: bit chatter
	43.5 ft: Changes to coarse sand to fine gravel sized fresh shell fragments				45	S-12, SPT 4+5+6 REC=18", 100%		43.5 - 48.5 ft: uniform drilling resistance, smooth drilling
	48.5 ft: Changes to coarse sand sized highly weathered shell fragments, weak HCl reaction (with shells)				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	-2.6		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,	SP-SM	-7.6					

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-787** Contract Number: 06120048 Sheet: 3 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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			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	-13.1		65	S-16, SPT 50/2" REC=2", 100%		
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	-17.6		70	S-17, SPT 6+12+50/4" REC=16", 100%		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 fragments, firm, coarse sand to fine gravel sized moderately weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	ML	-23.1		75	S-18, SPT 8+9+15 REC=18", 100%		73.5 - 78.5 ft: uniform drilling resistance, smooth drilling, olive gray drilling fluid
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	-28.1		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	-33.1		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	-38.1		90	S-21, SPT 7+10+16 REC=18", 100%		88.5 - 93.0 ft: flushed boring with water

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-787** Contract Number: 06120048 Sheet: 4 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
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	-43.1		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	-48.1		100	S-23, SPT 8+11+15 REC=18", 100%		
100.0			-50.6					

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

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-788** Contract Number: 06120048 Sheet: 1 of 2

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

North: 217495.9 ft **East:** 960896.1 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 52.1 (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	SAMPLING DATA	TESTS	REMARKS
	0.0 - 2.0 ft: 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. 0.0 to 2.5 ft: Uniform drilling resistance, brown cuttings
2.0	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	50.1			S-2, SPT 3+5+5 REC=18", 100%		1.5 - 15.7 ft: Labeled as S-7A 2.5 - 3.5 ft: Jar labeled as S-2A
3.5	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	48.6		5	S-3, SPT 2+4+5 REC=18", 100%		3.5 - 4.0 ft: Jar labeled as S-2B 5.0 - 7.5 ft: orangish gray cuttings
7.0	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 8.7 ft: Changes to gray	CL	45.1			S-4, SPT 3+5+6 REC=18", 100%		
9.0	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	43.1		10	S-5, SPT 6+6+9 REC=18", 100% 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.
14.5	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	37.6		15	S-7, SPT 8+10+16 REC=12", 67%		12.5 - 15.0 ft: dark gray drilling fluid
15.7	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 18.5 ft: Changes to wet, dark gray, estimated <5% silt	SP	36.4		20	S-8, SPT 8+10+16 REC=13", 72% S-9, SPT 36+50/5" REC=11", 100%		15.0 - 18.0 ft: gray drilling fluid 15.7 - 16.5 ft: Labeled as jar S-7B
	23.5 ft: Changes to estimated <5% shell fragments, weak HCl reaction (with shells)							

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-788** Contract Number: 06120048 Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP						
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	25.6		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	20.1		35	S-11, SPT 50/4" REC=3", 75%		32.0 ft: Bit chatter 33.5 - 48.5 ft: Uniform drilling resistance, smooth drilling, gray drilling fluid
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		16.1		40	S-12, SPT 18+7+6		
	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%		
50.0			2.1		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.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-789** Contract Number: 06120048 Sheet: 1 of 4

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

North: 217401.7 ft **East:** 960986.9 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 57.3 (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	SAMPLING DATA	TESTS	REMARKS
0.5	0.0 - 0.5 ft: Topsoil; contains organics, contains roots		56.8			S-1, SPT 1+1+2 REC=18", 100%	MC = 28.2%	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. 2.5 - 5.0 ft: orangish brown and gray cuttings 5.0 - 7.5 ft: orangish brown cuttings
2.0	0.5 - 2.0 ft: SANDY SILT, fine to medium grained sand; moist, light brown with mottles of orangish brown, contains roots, no HCl reaction	ML	55.3			S-2, SPT 1+2+4 REC=18", 100%	MC = 29.1%	
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	52.8		5	S-3, SPT 3+3+4 REC=8", 44%	MC = 26.6%	
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	50.3			S-4, SPT 2+2+5 REC=18", 100%	MC = 34.3%	7.5 - 10.0 ft: increased drilling resistance at 9.0 ft, smooth drilling, brownish orange 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	47.8		10	S-5, SPT 4+5+8 REC=18", 100%	MC = 27.3%	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.
12.0	9.5 - 12.0 ft: LEAN CLAY; moist, dark gray, contains mica, no HCl reaction, firm	CL	45.3			S-6, SPT 4+6+6 REC=18", 100%	MC = 25.4%	
14.5	12.0 - 14.5 ft: SANDY LEAN CLAY, fine grained sand; moist, dark gray, contains mica, no HCl reaction, firm	CL	42.8		15	S-7, SPT 2+3+6 REC=18", 100%	MC = 31.1%	
19.7	14.5 - 19.7 ft: CLAYEY SAND, fine grained sand; moist, dark gray, contains mica, no HCl reaction	SC	37.6		20	S-8, SPT 3+3+7 REC=18", 100%	MC = 32.0%	18.5 - 19.7 ft: Jar sampled as S-8A 19.7 - 20.0 ft: Jar labeled as S-8B 20.0 ft: grayish brown drilling fluid
22.0	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	35.3			S-9, SPT 13+16+23 REC=13", 72%	MC = 27.3%	
	22.0 - 27.0 ft: POORLY GRADED SAND, fine to medium grained sand; wet, light brown, estimated <5% silt, no HCl reaction	SP						

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-789** Contract Number: 06120048 Sheet: 2 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP						
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	30.3		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	25.3		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
37.0	37.0 - 41.0 ft: SILTY SAND, fine grained sand; wet, dark gray, contains cemented sands, no HCl reaction, strong cementation	SM	20.3		40	S-12, SPT 50/5" REC=4", 80%		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	16.3		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	10.3		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%		
57.0	57.0 - 67.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand; wet, dark gray, no HCl reaction	SP-SM	0.3					

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-789** Contract Number: 06120048 Sheet: 3 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
					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 *(continued)*
	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	-10.2		70	S-18, SPT 16+22+50/5" REC=16", 94%		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)		-14.7		75	S-19, SPT 14+14+27 REC=18", 100%		
		SP-SM			80	S-20, SPT 6+9+13 REC=18", 100%		78.5 - 98.5 ft: Advanced tricone bit: uniform drilling resistance, smooth drilling, gray drilling fluid
	83.5 ft: Changes to estimated 5 - 10% shell fragments				85	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	-29.7		90	S-22, SPT 6+8+13 REC=18", 100%		
92.0		SM	-34.7					

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-789** Contract Number: 06120048 Sheet: 4 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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			95	S-23, SPT 5+8+10 REC=18", 100%		78.5 - 98.5 ft: Advanced tricone bit: uniform drilling resistance, smooth drilling, gray drilling fluid *(continued)*
	98.5 ft: Changes to strong HCl reaction (with shells and soil)				100	S-24, SPT 7+8+10 REC=18", 100%		
100.0			-42.7					

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

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-790** Contract Number: 06120048 Sheet: 1 of 2

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

North: 217278.1 ft **East:** 961110.5 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	SAMPLING 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 smooth drilling, brownish, orange cuttings
0.6	0.2 - 0.6 ft: GRAVEL		72.1					
	0.6 - 4.5 ft: SILTY SAND, fine and coarse grained sand, subangular particles; moist, orangish brown, no HCl reaction 2.5 ft: Changes to subrounded particles; light gray and brownish orange	SM				S-1, SPT 5+5+5 REC=17", 94% S-2, SPT 4+3+3 REC=10", 56%		2.5 - 5.0 ft: orangish brown 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, subounded 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%		5.0 - 7.5 ft: brownish orange 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%		7.5 - 10.0 ft: orangish brown 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%		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 20	S-6, SPT 2+4+4 REC=14", 78% 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 18.5 - 23.5 ft: brownish gray drilling fluid
22.0	22.0 - 27.0 ft: LEAN CLAY; moist, dark gray, contains mica, no HCl reaction, firm	CL	50.7			S-8, SPT 4+8+10 REC=18", 100%		

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-790** Contract Number: 06120048 Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		CL						23.5 - 28.5 ft: increased drilling resistance with depth, no distinct increase at a particular depth, gray drilling fluid *(continued)*
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
47.0	47.0 - 49.7 ft: SILTY SAND, fine grained sand; moist, dark gray, contains mica, weak HCl reaction	SM	25.7			S-13, SPT 6+8+50/2" REC=14", 100%		45.0 - 48.5 ft: uniform drilling resistance, loss of about 70 gallons of drilling fluid
49.7			23.0					

Bottom of Boring at 49.7 ft.
Boring backfilled with betonite and cement grout using tremie upon completion.

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-791** Contract Number: 06120048 Sheet: 1 of 4

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

North: 217143.5 ft **East:** 961245.1 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 87.5 (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	SAMPLING DATA	TESTS	REMARKS
	0.0 - 4.5 ft: FILL, sampled as silty sand, fine to coarse grained sand, rounded particles; moist, brown and yellowish brown, estimated <5% roots, no HCl reaction, small roots 0-0.4 ft 2.6 ft: Changes to 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	FILL				S-1, SPT 1+5+6 REC=16", 89%	MC = 7.2%	0.0 ft: Advanced 4-1/4" I.D. HSA to 19.0 ft. 0.0 to 2.5 ft: uniform drilling resistance
						S-2, SPT 1+2+1 REC=14", 78%	MC = 8.1%	2.6 - 5.0 ft: pilot bit used to clear auger plug
4.5			83.0					
	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			5	S-3, SPT 1+2+4 REC=17", 94%	MC = 8.4%	5.0 - 7.5 ft: slight bit resistance (possible gravel), changed to a new shoe for spoon
7.0			80.5					
						S-4, SPT 3+3+3 REC=15", 83%	LL = NP MC = 4.9%	7.5 - 10.0 ft: uniform drilling resistance
	7.0 - 17.5 ft: POORLY GRADED SAND WITH SILT, fine to coarse grained sand, subrounded to subangular particles; moist, light brown, no HCl reaction, subangular gravel 10.0 ft: Changes to estimated <5% fine gravel 12.5 ft: Changes to fine to medium grained sand, subrounded to subangular particles; light brown, no HCl reaction 15.0 ft: Changes to fine to coarse grained sand; wet, orangish brown, no HCl reaction	SP-SM			10	S-5, SPT 3+5+6 REC=17", 94%	MC = 5.9%	10.0 - 12.5 ft: easy drilling
						S-6, SPT 5+7+8 REC=17", 94%	MC = 5.4%	12.5 - 15.0 ft: Hammer Energy test performed
					15	S-7, SPT 3+5+4 REC=15", 83%	MC = 15.7%	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			70.0					
	17.5 - 22.5 ft: SILTY SAND, fine to coarse grained sand, subrounded to subangular particles; wet, yellowish brown, no HCl reaction, subrounded gravel, contains 5" layer of LEAN CLAY WITH SAND (CL), moist, gray at 19.4 ft	SM			20	S-8, SPT 3+4+6 REC=15", 83%	MC = 23.1%	19.0 - 23.5 ft: uniform drilling resistance
22.5			65.0					
	22.5 - 28.5 ft: SILTY SAND, fine to coarse grained sand; wet, yellowish brown, estimated 5 - 10% fine gravel, no HCl reaction, angular to subangular gravel, gravels increase with depth	SM				S-9, SPT 4+14+18 REC=18", 100%	MC = 14.7%	

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-791** Contract Number: 06120048 Sheet: 2 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SM						23.5 - 28.5 ft: Slight drilling resistance at 24.0 ft, (possible gravel), clay cuttings. Hammer Energy test performed *(continued)*
28.5	28.5 - 37.0 ft: FAT CLAY WITH SAND, fine grained sand; moist, light gray, contains mica, firm, homogeneous structure	CH	59.0		30	S-10, SPT 3+4+5 REC=18", 100%	LL = 59 PL = 23 MC = 34.6%	28.5 - 33.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid at 33.5 ft
	33.5 ft: Changes to estimated <5% fine grained sand, firm				35	S-11, SPT 4+4+6 REC=18", 100%		33.5 - 38.5 ft: easy drilling
37.0	37.0 - 42.0 ft: ELASTIC SILT; moist, light gray, estimated <5% fine grained sand, contains mica, hard, homogeneous structure	MH	50.5		40	S-12, SPT 4+8+10 REC=18", 100%		38.5 - 43.5 ft: Hammer Energy test performed
42.0	42.0 - 47.0 ft: SILTY SAND, fine grained sand; wet, gray, contains mica, no HCl reaction, homogeneous structure	SM	45.5		45	S-13, SPT 5+7+8 REC=18", 100%		43.5 - 48.5 ft: slight bit chatter from 47.0 to 47.5 ft, (possible gravel), driller had considerable difficulty retrieving spoon
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	40.5		50	S-14, SPT 91+100/2" REC=8", 100%		48.5 - 53.5 ft: slower drilling rate, intermittent drilling resistance
51.5	51.5 - 61.0 ft: POORLY GRADED SAND WITH SILT, fine grained sand; wet, light gray, contains mica, no HCl reaction, homegeneous structure	SP-SM	36.0		55	S-15, SPT 32+57+100/3" REC=9", 60%		53.5 - 58.5 ft: uniform drilling resistance, Hammer Energy test performed

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-791** Contract Number: 06120048 Sheet: 3 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SP-SM			60	S-16, SPT 50/5" REC=5", 100%		58.5 - 63.5 ft: slight rig chatter from 62.0 to 63.5 ft, (possible gravel) *(continued)*
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	26.5		65	S-17, SPT 50/2" REC=2", 100%		63.5 - 68.5 ft: itermittent drilling resistance
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	21.5		70	S-18, SPT 50/5" REC=5", 100%		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	16.0		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
	78.5 ft: Changes to light gray and greenish gray, estimated <5% shell fragments, weak HCl reaction (with shells)				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	5.5		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	0.5		90	S-22, SPT 5+5+6 REC=18", 100%		88.5 - 93.5 ft: uniform drilling resistance, easy drilling.
92.0		SP-SM	-4.5					

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-791** Contract Number: 06120048 Sheet: 4 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	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			95	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	-11.0		100	S-24, SPT 9+13+14 REC=18", 100%		
100.0			-12.5					

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

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-821** Contract Number: 06120048 Sheet: 1 of 2

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

North: 218736.3 ft **East:** 961124.6 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	SAMPLING DATA	TESTS	REMARKS
	0.0 - 2.5 ft: FILL, sampled as silty gravel with sand, fine to coarse grained sand, angular particles; moist, light gray, no HCl reaction, stone base	FILL				S-1, SPT 21+32+27 REC=18", 100%	MC = 2.6%	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
2.5	2.5 - 4.5 ft: FILL, sampled as silty sand, fine to coarse grained sand, subangular particles; moist, brown and gray, estimated <5% shell fragments, estimated <5% crushed stone, fresh shell fragments, strong HCl reaction (with shells), no HCl reaction (with soil)	FILL	6.4			S-2, SPT 27+13+16 REC=18", 100%	MC = 8.2%	2.5 - 5.0 ft: rig chatter to 2.8 ft (crushed stone base possibly ends at 2.8 ft), brown cuttings
4.5	4.5 - 9.5 ft: POORLY GRADED SAND WITH SILT AND GRAVEL, fine to coarse 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	4.4		5	S-3, SPT 4+4+3 REC=0", 0%		5.0 - 7.5 ft: uniform drilling resistance, smooth drilling, dark gray cuttings
						S-4, SPT 9+5+6 REC=11", 61%	MC = 9.4%	
9.5	9.5 - 17.0 ft: SILTY SAND, 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)	SM	-0.6		10	S-5, SPT 2+3+5 REC=17", 94%	LL = NP MC = 33.9%	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					S-6, SPT 3+3+5 REC=18", 100%	MC = 31.3%	
17.0	17.0 - 22.0 ft: 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	-8.1		15	S-7, SPT 25+23+14 REC=16", 89%	LL = NP MC = 20.2%	17.5 ft: bit chatter, gray drilling fluid
22.0	22.0 - 32.0 ft: SILTY SAND, fine to coarse grained sand; wet, dark gray, estimated <5% shell fragments, strong HCl reaction, moderate cementation, coarse sand to fine gravel size fresh to moderately weathered shell fragments,	SM	-13.1		20	S-8, SPT 21+10+9 REC=18", 100%	MC = 29.1%	21.0 - 21.5 ft: bit chatter

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-821** Contract Number: 06120048 Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	coarse sand as cemented sands	SM			30	S-9, SPT 31+35+18 REC=14", 78%		23.5 - 48.5 ft: uniform drilling resistance, smooth drilling, gray drilling fluid *(continued)*
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		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		45	S-12, SPT 7+8+10 REC=18", 100%		
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	S-13, SPT 5+9+11 REC=18", 100%		
50.0			-41.1					

Bottom of Boring at 50.0 ft.

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

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-821A** Contract Number: 06120048 Sheet: 1 of 4

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: K. Bell

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

Method: 6" O.D. Drag Bit (Mud Rotary)

Hammer Type: Auto Hammer (140 lb)

Dates Started: 11/11/08 **Finished:** 11/13/08

North: 218571.3 ft **East:** 960962.8 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 25.4 (ft) **Total Depth:** 115.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	11/11	1:45 PM	10.0'	---	---
Start of Day	11/12	7:00 AM	5.0'	---	---
Start of Day	11/13	7:00 AM	13.0'	---	---
Completion	11/13	9:00 AM	1.0'	---	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	0.0 - 17.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand; wet, orangish brown and yellowish brown, contains mica, contains roots, no HCl reaction	SP-SM			5 10	UD-1, UNDIST REC=14", 58%	PP = 3.00 tsf PP = 3.00 tsf PP = 2.50 tsf	0.0 ft: Material description and USCS symbols are based on observations of cuttings contained in drilling fluid and limited UD sample where available. 0.0 ft: These decriptions, symbols and boundaries provide a general indication of material changes with depth, but do not represent detailed conditions. 0.0 ft: Refer to B-821 of the 2008 investigation for more detailed material descriptions in this area. 0.0 ft: advanced 6.0 O.D. tricone roller bit (mud rotary) to 115.0 ft; driller mixed 1.5 bags of bentonite with 100 gallons of water to make drilling fluid 0.0 - 10.0 ft: uniform drilling resistance, smooth and easy drilling, orangish brown drilling fluid, clumps of bentonite and clayey sand, fine to medium sand, contains roots in top 2.0 ft in cuttings 10.0 - 12.0 ft: pitcher sampler 10.0 - 12.0 ft: smooth drilling, fine to medium
	12.0 ft: Changes to orangish brown					UD-2, UNDIST REC=12", 50%	PP = 3.00 tsf PP = 2.50 tsf PP = 3.00 tsf	
					15			
17.0	17.0 - 25.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand; wet, olive gray, contains shells, weak HCl reaction (with shells and soil)	SP-SM	8.4		20	UD-3, UNDIST REC=24", 100%	PP = 4.50 tsf PP = 3.50 tsf PP = 4.00 tsf	

(continued)

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-821A** Contract Number: 06120048 Sheet: 2 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
25.0	25.0 - 46.0 ft: SILTY SAND, fine to medium grained sand; wet, grayish olive, contains shells, weak HCl reaction (with shells and soil)	SM	0.4		30 35 40 45 50 55	UD-4, UNDIST REC=24", 100% UD-5, UNDIST REC=18", 75% UD-6, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf PP = 3.00 tsf PP = 2.50 tsf PP = 3.00 tsf PP > 4.50 tsf PP = 3.50 tsf PP > 4.50 tsf	sand in cuttings 12.0 - 14.0 ft: pitcher sample 12.0 - 20.0 ft: harder drilling from 17.5 to 18.0 ft (possible cemented sand) 20.0 - 22.0 ft: pitcher sample 20.0 - 30.0 ft: uniform drilling resistance, smooth and easy drilling, light gray drilling fluid, clumps of silty sand, fine to medium sand in cuttings *(continued)* 30.0 - 32.0 ft: pitcher sample 30.0 - 40.0 ft: uniform drilling resistance, light olive gray drilling fluid, silty sand, fine to medium sand and fine to medium sand size , fresh to moderately weathered shells in cuttings 35.0 - 38.0 ft: harder drilling with rig chatter (possible cemented sands) 38.0 - 40.0 ft: very hard drilling with slower advancement 40.0 - 42.0 ft: pitcher sample 40.0 - 50.0 ft: uniform drilling resistance, harder drilling, light olive gray drilling fluid, clumps of silty sand, fine to medium sand and fine to medium sand size fresh to moderately weathered shells in cuttings 50.0 - 52.0 ft: pitcher sample
46.0	46.0 - 66.0 ft: SANDY SILT, fine grained sand; wet, grayish olive, contains shells, weak HCl reaction (with shells and soil)	ML	-20.6					

(continued)

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-821A** Contract Number: 06120048 Sheet: 3 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	60.0 ft: Changes to moist, olive and grayish olive	ML			60	UD-7, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	50.0 - 60.0 ft: unform drilling resistance, smooth and easy drilling, light olive gray drilling fluid, clumps of silty sand, fine to medium sand, and fine to medium sand size fresh to moderately weathered shells in cuttings *(continued)*
					65			
66.0	66.0 - 77.0 ft: SILTY SAND, fine to medium grained sand; wet, olive gray and light olive, contains shells, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-40.6		70	UD-8, UNDIST REC=12", 50%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	60.0 - 62.0 ft: pitcher sample 60.0 - 70.0 ft: uniform drilling resistance, smooth and easy drilling, light olive gray drilling fluid, clumps of sandy silt, fine sand and fine to medium sand size fresh to highly weathered shells in cuttings
	72.0 ft: Changes to weak HCl reaction (with shells and soil)					UD-9, UNDIST REC=12", 50%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	70.0 - 72.0 ft: pitcher sample 70.0 - 72.0 ft: slightly harder drilling
					75			72.0 - 74.0 ft: pitcher sample 72.0 - 80.0 ft: uniform drilling resistance, smooth drilling, light olive gray, drilling fluid clumps of sandy silt, fine to medium sand and fine to medium sand size, fresh to moderately weathered shells in cuttings
77.0	77.0 - 86.0 ft: SILT WITH SAND, fine grained sand; moist, olive, contains mica, contains shells, weak HCl reaction (with shells and soil)	ML	-51.6		80	UD-10, UNDIST REC=24", 100%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	
					85			80.0 - 82.0 ft: pitcher sample 80.0 - 90.0 ft: uniform drilling resistance, slightly harder drilling, olive gray drilling fluid
86.0	86.0 - 92.0 ft: SANDY SILT, fine grained sand; moist, dark grayish olive, contains mica, weak HCl reaction	ML	-60.6		90	UD-11, UNDIST REC=11", 46%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	90.0 - 92.0 ft: pitcher sample 90.0 - 92.0 ft: uniform drilling resistance, easy
92.0		SM	-66.6					

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TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-821A** Contract Number: 06120048 Sheet: 4 of 4

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	92.0 - 97.0 ft: SILTY SAND, fine grained sand; moist, dark olive, contains mica, no HCl reaction	SM			95	UD-12, UNDIST REC=19", 79%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	drilling, olive gray drilling fluid, sandy silt and fine sand in cuttings 92.0 - 94.0 ft: pitcher sample *(continued)* 92.0 - 100.0 ft: uniform drilling resistance, smooth and easy drilling, olive gray drilling fluid, clumps of sandy silt and fine sand in cuttings *(continued)*
97.0	97.0 - 115.0 ft: SILT WITH SAND, fine grained sand; moist, grayish olive, contains mica, weak HCl reaction		-71.6		100	UD-13, UNDIST REC=21", 88%	PP > 4.50 tsf PP > 4.50 tsf PP > 4.50 tsf	100.0 - 102.0 ft: pitcher sample 100.0 - 115.0 ft: uniform drilling resistance, smooth and easy drilling, olive gray drilling fluid, clumps of sandy silt and fine sand in cuttings
		ML			105			
					110			
115.0			-89.6		115			

Bottom of Boring at 115.0 ft.
Boring backfilled with cuttings upon completion.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-821B** Contract Number: 06120048 Sheet: 1 of 1

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: B. Glass/K. Bell

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

Method: 3-3/4" I.D. Hollow Stem Auger

Hammer Type: Auto Hammer (140 lb)

Dates Started: 11/5/08 **Finished:** 11/5/08

North: 218727.2 ft **East:** 961275.2 ft

Coordinate System: MD State Plane

Ground Surface Elevation: 6.3 (ft) **Total Depth:** 9.5 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Completion	11/5	1:15 PM	Dry	---	6.5'

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	0.0 - 2.0 ft: FILL, sampled as well graded gravel with silt and sand, fine gravel, subrounded particles; moist, dark gray, estimated <5% roots, no HCl reaction, fine gravel as crushed stone	FILL				S-1, SPT 2+3+3 REC=8", 44%		0.0 - 2.5 ft: advanced 3 1/4" ID HSA to 9.5 ft; rough drilling, rig chatter, crushed stone cuttings
2.0			4.3					
	2.0 - 9.5 ft: FILL, sampled as silty gravel, fine gravel; moist, brown and gray, contains fine to medium sand, no HCl reaction, subrounded gravel, fine gravel as crushed stone					S-2, SPT 6+50/1" REC=6", 86%		2.5 - 5.0 ft: very hard drilling, heavy rig chatter, auger grinding
	5.0 ft: Changes to estimated <5% fine to medium sand, rounded to subrounded fine gravel	FILL			5	S-3, SPT 50/2" REC=1", 50%		5.0 - 7.5 ft: heavy rig chatter, heavy grinding (possible crushed stone or concrete)
	7.5 ft: Changes to dry, gray, estimated <5% fine to coarse grained sand, subangular fine gravel, fine gravel as crushed stone or concrete					S-4, SPT 50/1" REC=1", 100%		7.5 - 9.5 ft: heavy rig chatter, heavy grinding
9.5			-3.2					

Bottom of Boring at 9.5 ft.
Boring backfilled with soil cutting upon completion as directed by Contractor

9.5 ft: auger refusal at 9.5 ft

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-821C** Contract Number: 06120048 Sheet: 1 of 2

Contractor: Connelly and Associates, Inc.
Frederick, Maryland

Contractor Foreman: T. Chew

Schnabel Representative: K. Bell

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

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

Hammer Type: Auto Hammer (140 lb)

Dates Started: 11/5/08 **Finished:** 11/6/08

North: 218739.5 ft **East:** 961258.1 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 7.4 (ft) **Total Depth:** 30.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	11/5	1:40 PM	10.0'	8.5'	---
Start of Day	11/6	8:17 AM	9.5'	12.5'	---
Completion	11/6	9:00 AM	1.0'	12.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	0.0 - 8.5 ft: FILL, sampled as silty sand, fine to coarse grained sand, subrounded particles; moist, estimated <5% fine gravel, no HCl reaction, rounded fine gravel	FILL			5			0.0 ft: Material descriptions and USCS symbols (up to a depth of 10 ft) are based on observations of cuttings contained in drilling fluid. 0.0 ft: These descriptions, symbols and boundaries provide a general indication of material changes with depth, but do not represent detailed conditions. Refer to B-821 of the 2008 investiagion for more detailed material description in this area.
8.5	8.5 - 12.5 ft: PROBABLE FILL, sampled as silty sand, fine to coarse grained sand, subrounded particles; wet, orangish brown, no HCl reaction	FILL	-1.1		10	S-1, SPT 2+2+1 REC=1", 6%		0.0 - 10.0 ft: Advanced 3 1/4" ID HSA to 12.5 ft. Smooth and easy drilling, pilot bit used to clear augers.
12.5	12.5 - 22.0 ft: SILTY SAND, fine to medium grained sand; wet, grayish olive, estimated 5 - 10% shells, fine to medium sand size fresh to highly weathered shells, strong HCl reaction (with shells), weak HCl reaction (with soil)	SM	-5.1		15	S-2, SPT 2+3+5 REC=18", 100%		10.0 - 12.5 ft: orangish brown silty sand cuttings 12.5 ft: driller switched to 3.0" OD tricone roller bit (mud rotary); driller mixed 1 bag of bentonite with 100 gallons of water to make drilling fluid
	18.5 ft: Changes to light gray and gray, estimated <5% fine gravel, subangular to angular fine gravel, fine gravel as cemented sand, moderately to highly weathered shells, moderate to strong cementation				20	S-3, SPT 8+8+6 REC=18", 100%		12.5 - 13.5 ft: advanced 3.0" OD tricone roller bit to 30.0 ft; uniform drilling resistance, smooth drilling, gray drilling fluid
22.0	22.0 - 27.0 ft: POORLY GRADED SAND WITH SILT, fine to medium grained sand; wet, olive gray, estimated <5% shells, estimated <5% gravel, fine to medium sand size, highly weathered shells, subrounded fine gravel, weak HCl	SP-SM	-14.6			S-4, SPT 4+8+13 REC=16", 89%		13.5 - 18.5 ft: smooth and easy drilling, olive gray

(continued)

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Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-821C** Contract Number: 06120048 Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	reaction (with shells, gravel and soil)	SP-SM						drilling fluid, clumps of bentonite/silty sand, fine to medium sand and fine to medium sand size fresh to moderately weathered shells in cuttings
27.0	27.0 - 30.0 ft: SILTY SAND, fine to medium grained sand; wet, grayish olive, estimated 5 - 10% shells, fine to medium sand size fresh to highly weathered shells, weak HCl reaction (with shells and soil)	SM	-19.6					18.5 - 23.5 ft: slightly harder drilling, clumps of bentonite and silty sand, fine sand particles in cuttings 23.5 - 28.5 ft: uniform drilling resistance, smooth and easy drilling *(continued)*
30.0			-22.6		30	S-5, SPT 5+5+9 REC=18", 100%		

Bottom of Boring at 30.0 ft.
Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-822** Contract Number: 06120048 Sheet: 1 of 2

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: 8/21/08 **Finished:** 8/22/08

North: 218440.2 ft **East:** 960840.8 ft **By:** Land Survey

Coordinate System: MD State Plane

Ground Surface Elevation: 38.8 (ft) **Total Depth:** 50.0 ft

Groundwater Observations

	Date	Time	Depth	Casing	Caved
Encountered	8/22	10:14 AM	23.5'	14.5'	---
Completion	8/22	10:56 AM	6.2'	14.5'	---

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
	0.0 - 4.5 ft: SILTY SAND, fine to medium grained sand; moist, dark brown, contains mica, contains roots, no HCl reaction	SM				S-1, SPT 1/12"+1 REC=8", 44%	MC = 9.4%	0.0 ft: advanced 4 1.4 ID HSA to 14.5 ft 0.0 - 2.5 ft: uniform drilling resistance, smooth drilling, brown cuttings, used pilot bit to clear augers
	2.5 ft: Changes to fine to coarse grained sand; brown, no mica					S-2, SPT 2+2+3 REC=13", 72%	MC = 11.7%	
4.5	4.5 - 7.0 ft: LEAN CLAY; moist, orangish brown and light gray, estimated 5 - 10% fine grained sand, contains mica, no HCl reaction, firm	CL	34.3		5	S-3, SPT 3+5+7 REC=13", 72%	MC = 25.8%	
7.0	7.0 - 17.5 ft: SANDY FAT CLAY, fine grained sand; moist, light gray with bands of orangish brown, contains roots, no HCl reaction, soft	CH	31.8			S-4, SPT 1+3+4 REC=9", 50%	LL = 53 PL = 21 MC = 23.1%	7.5 - 10.0 ft: orangish brown cuttings
	10.0 ft: Changes to fine to medium grained sand; no roots				10	S-5, SPT 3+4+5 REC=13", 72%	MC = 34.8%	
	12.5 ft: Changes to light gray and orangish brown					S-6, SPT 2+2+2 REC=16", 89%	LL = 45 PL = 22 MC = 39.2%	
	14.3 ft: Changes to contains a 0.5-inch layer of iron cemented sand				15			14.5 ft: switched to 3 1/2 OD tricone roller bit (mud rotary and advanced to 50.0 ft, mixed 100 gals of water with one bag of bentonite to make drilling fluid
17.5	17.5 - 27.5 ft: SILTY SAND, fine to coarse grained sand; moist, brown, estimated 5 - 10% shell fragments, estimated 5 - 10% fine gravel, strong cementation, fine gravel as cemented sand, fine gravel size fresh to highly weathered shell fragments, strong HCl (with shells, cemented sands and soil)	SM	21.3			S-7, SPT 36+25+14 REC=14", 78%	MC = 18.6%	14.5 - 18.5 ft: uniform drilling resistance, brown fluid drilling
					20			18.5 - 20.0 ft: bit chatter, brown drilling fluid
	23.5 ft: Changes to dark gray, coarse sand to fine gravel size shell fragments					S-8, SPT 13+10+7 REC=15", 83%	MC = 29.9%	23.5 - 24.5 ft: bit chatter, gray drilling fluid

(continued)

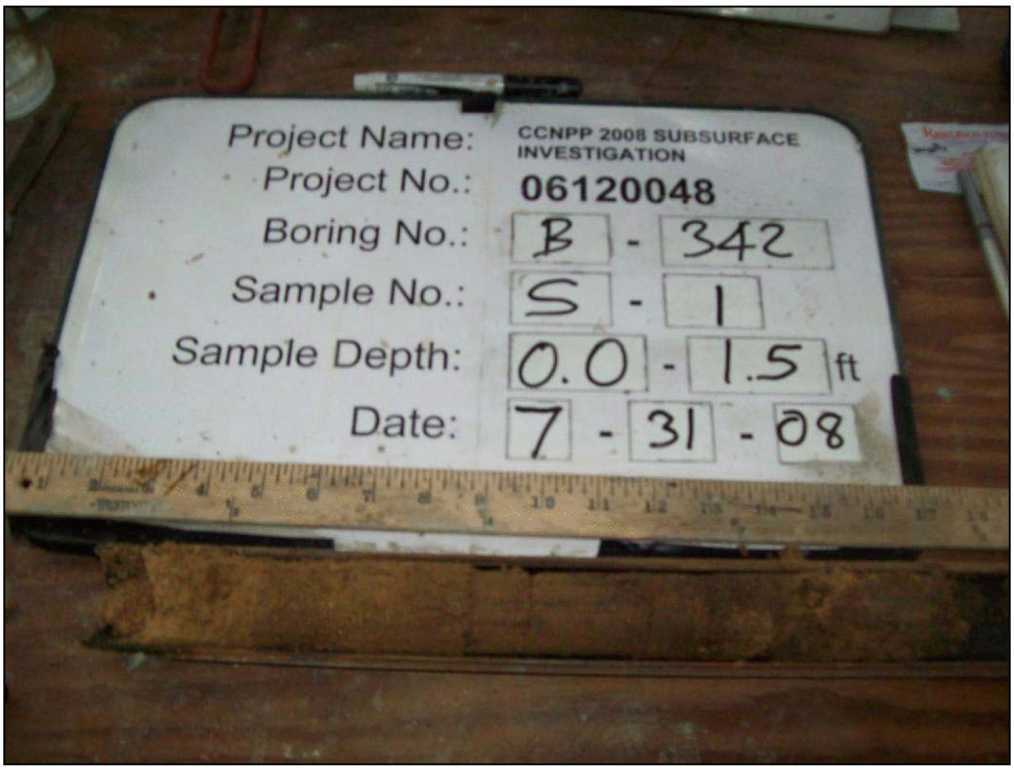
Schnabel Engineering	TEST BORING LOG	Project: CCNPP Subsurface Investigation Calvert County, Maryland Bechtel Job No. 23257	Boring Number: **B-822** Contract Number: 06120048 Sheet: 2 of 2

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DEPTH	SAMPLING DATA	TESTS	REMARKS
		SM						
27.5	27.5 - 37.5 ft: POORLY GRADED SAND, fine to medium grained sand; wet, dark gray, estimated 5 - 10% shell fragments, coarse sand size moderately to highly weathered shell fragments, strong HCl reaction (with shells), weak HCl reaction (with soil)	SP	11.3		30	S-9, SPT 6+6+8		29.0 - 29.5 ft: bit chatter
	33.5 ft: Changes to estimated <5% shell fragments, fresh to highly weathered shell fragments, no HCl reaction (with shells and soil)				35	S-10, SPT 3+5+7 REC=13", 72%		33.5 - 38.5 ft: uniform resistance, smooth drilling, gray drilling fluid
37.5	37.5 - 42.5 ft: POORLY GRADED SAND, fine to medium grained sand; wet, dark gray, no HCl reaction	SP	1.3		40	S-11, SPT 3+4+7 REC=18", 100%		
42.5	42.5 - 47.5 ft: POORLY GRADED SAND WITH SILT, fine grained sand; moist, olive gray, estimated <5% shell fragments, coarse sand size highly weathered shell fragments, weak HCl reactions (with shells and soil)	SP-SM	-3.7		45	S-12, SPT 3+5+6 REC=18", 100%		43.5 - 48.5 ft: olive gray drilling fluid
47.5	47.5 - 50.0 ft: POORLY GRADED SAND, fine to medium grained sand; wet, dark gray, estimated 5 - 10% shell fragments, estimated 5 - 10% fine gravel, medium sand to fine gravel size fresh to highly weathered shell fragments, fine gravel as cemented sand, strong HCl reaction (with shells, cemented, sand and soil)	SP	-8.7		50	S-13, SPT 8+17+27 REC=15", 83%		47.5 - 48.0 ft: bit chatter
50.0			-11.2					

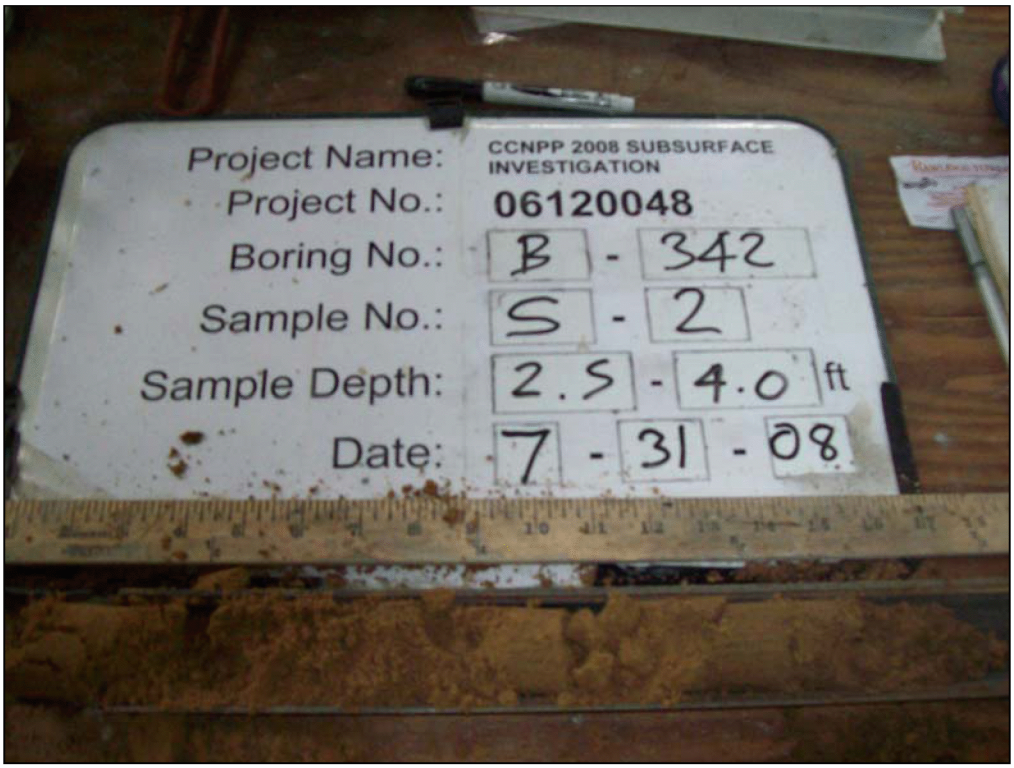
Bottom of Boring at 50.0 ft.
Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

TEST BORING LOG COL 06120048 CALVERT CLIFF LOGS.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 2/13/09

PHOTOS OF SPT SAMPLES
(673 Pages)

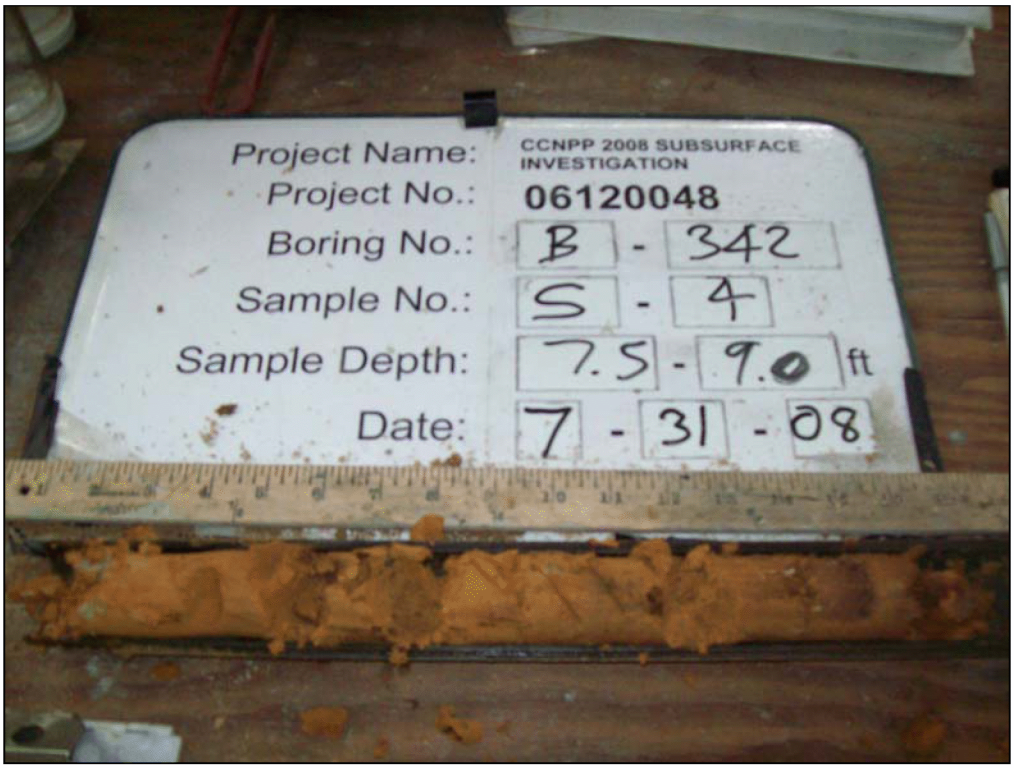


B-342; S-1
0.0 – 1.5 ft



B-342; S-2
2.5 – 4.0 ft

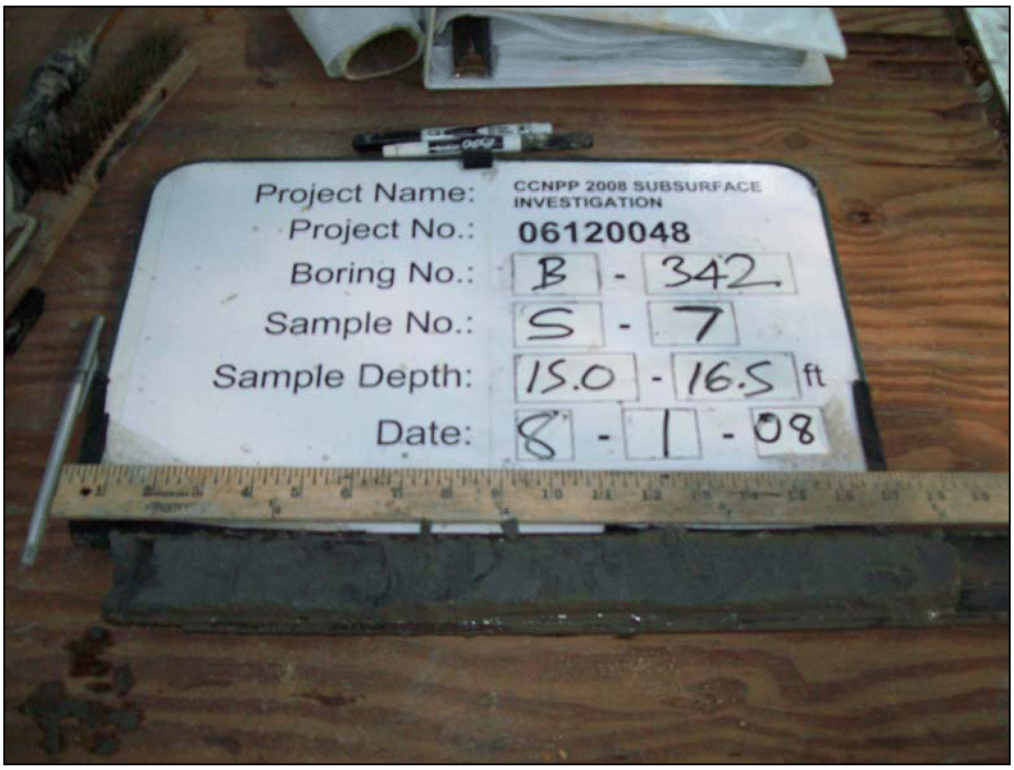
B-342; S-3
5.0 – 6.5 ft



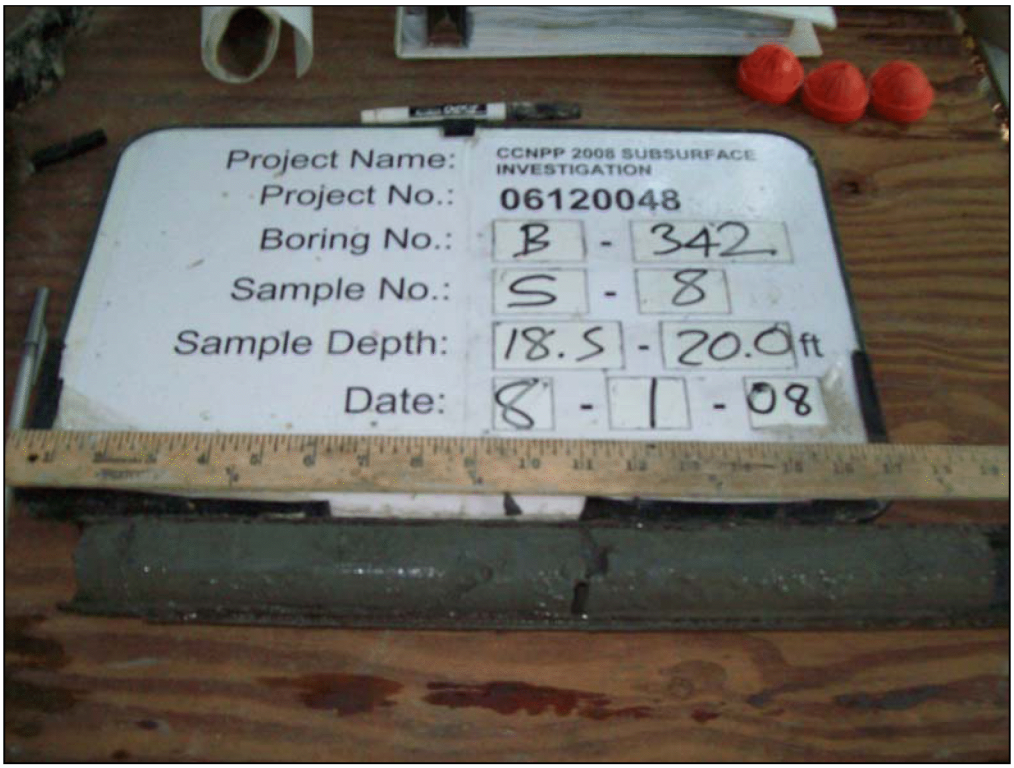
B-342; S-4
7.5 – 9.0 ft

B-342; S-5
10.0 – 11.5 ft

B-342; S-6
12.5 – 14.0 ft

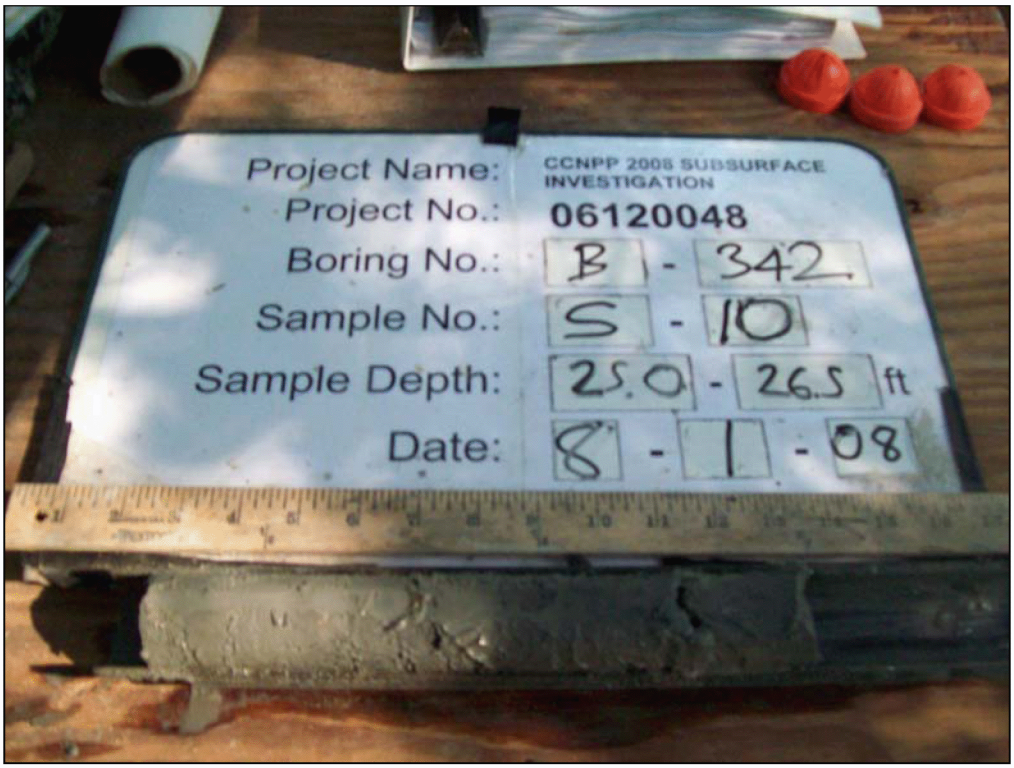


B-342; S-7
15.0 – 16.5 ft



B-342; S-8
18.5 – 20 ft

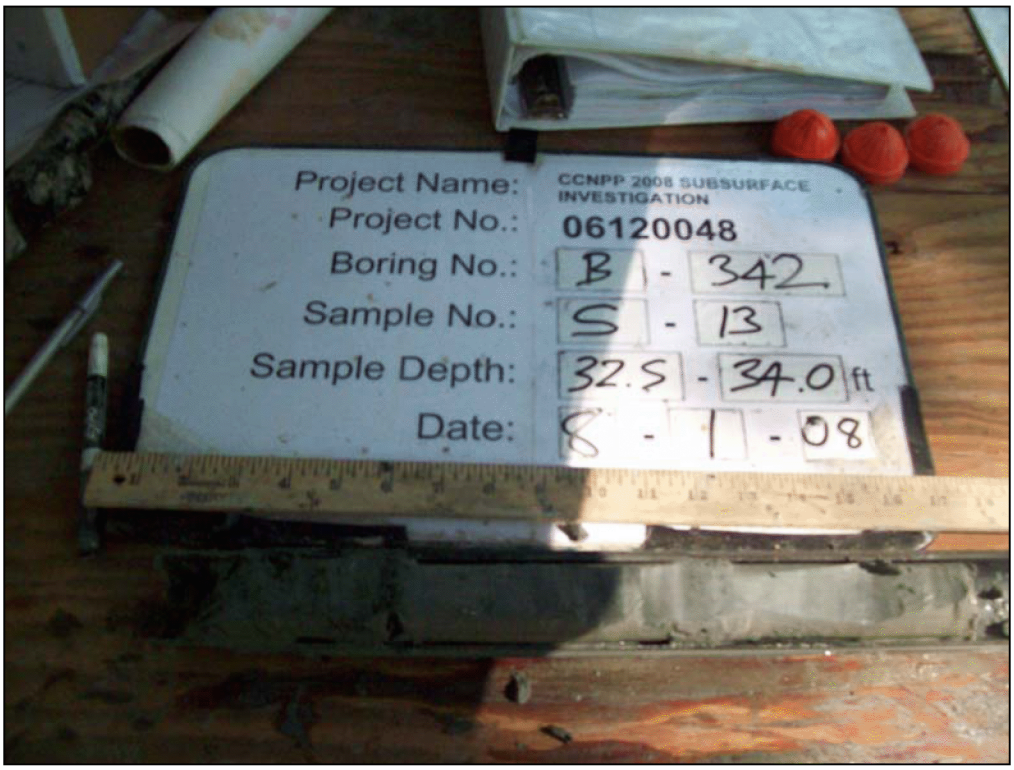
B-342; S-9
23.5 – 25.0 ft



B-342; S-10
25.0 – 26.5 ft

B-342; S-11
27.5 – 29.0 ft

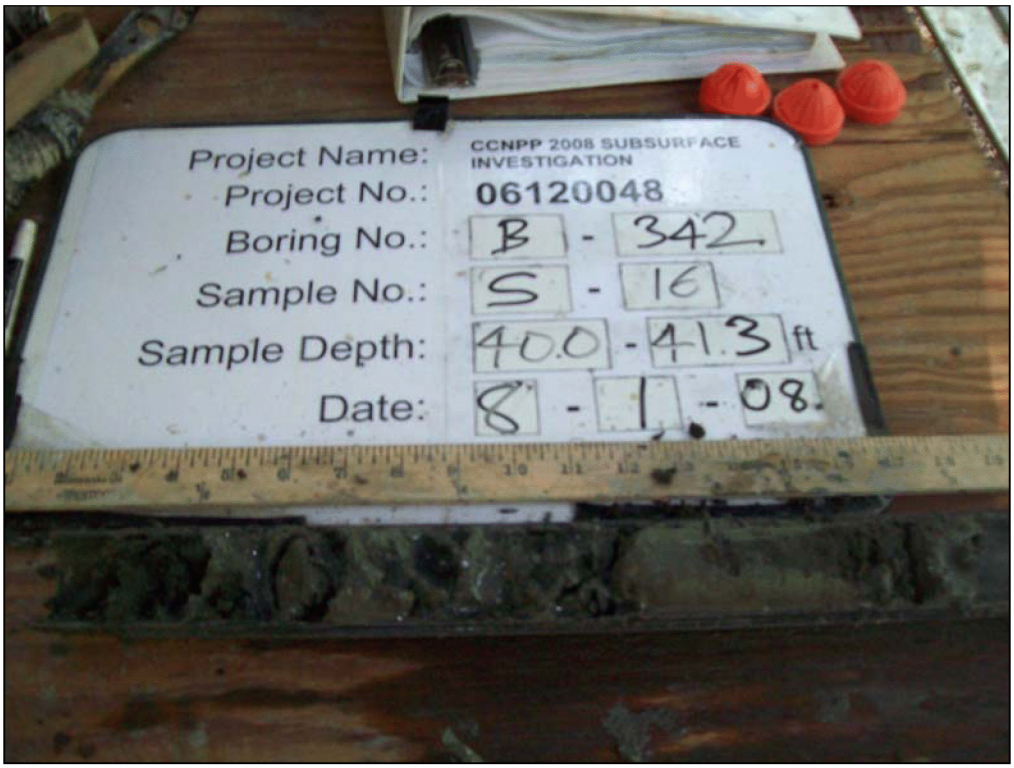
B-342; S-12
30.0 – 31.5 ft



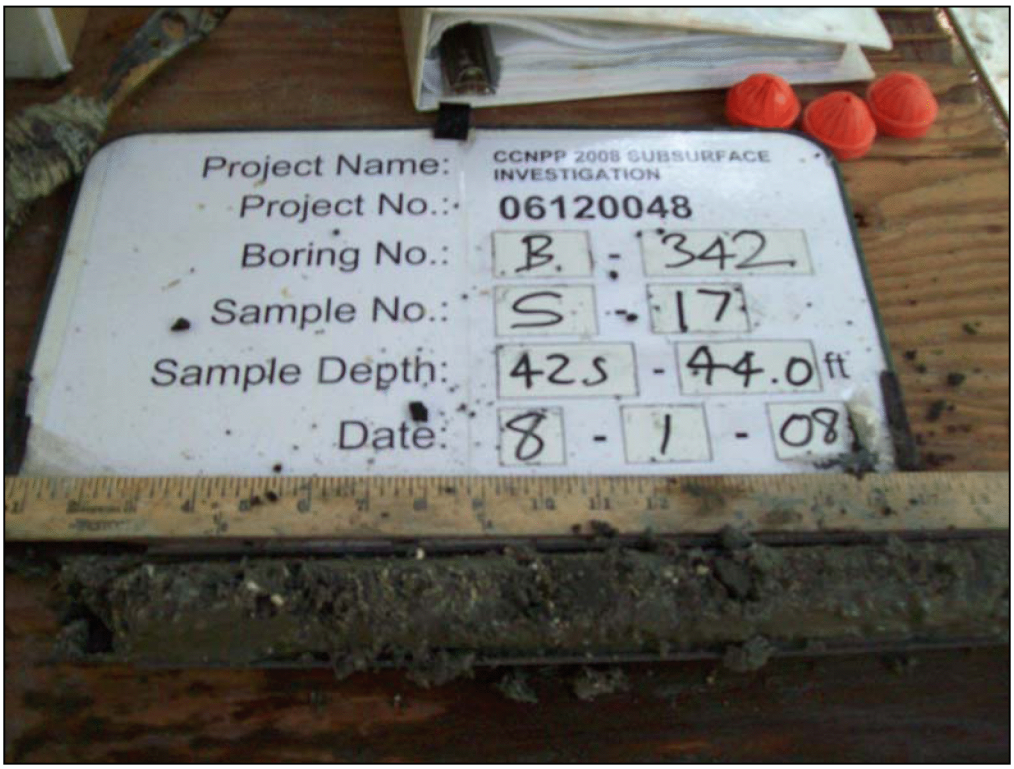
B-342; S-13
32.5 – 34.0 ft

B-342; S-14
35.0 – 36.5 ft

B-342; S-15
37.9 – 39.0 ft (Photo Unavailable)

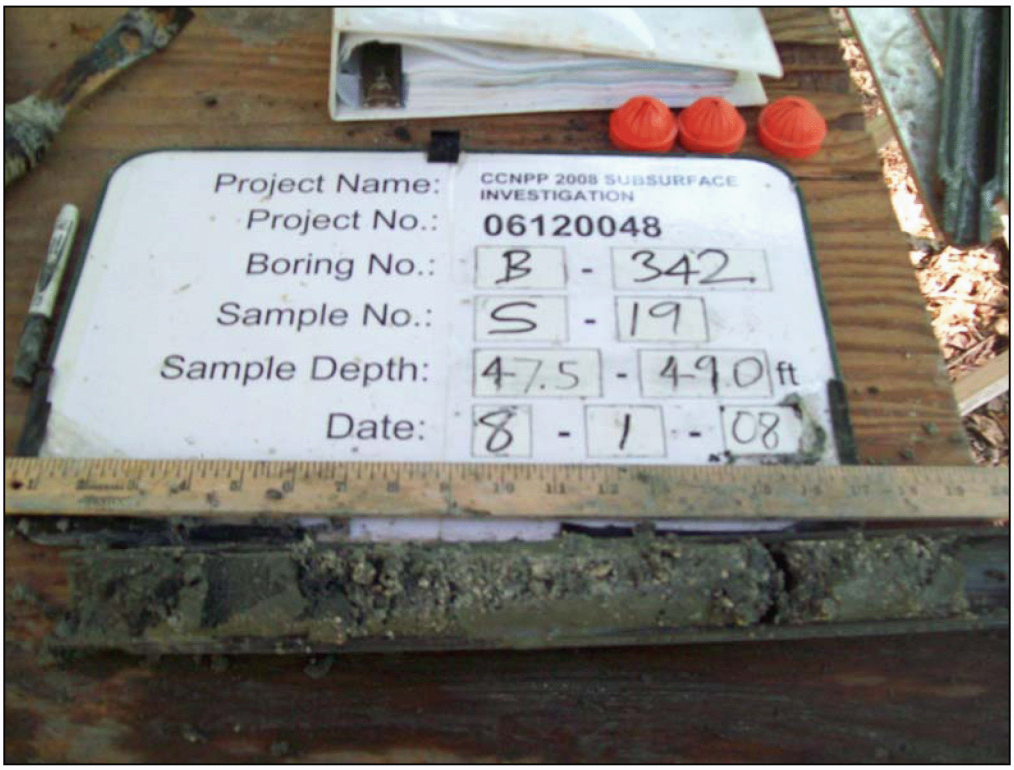


B-342; S-16
40.0 – 41.3 ft



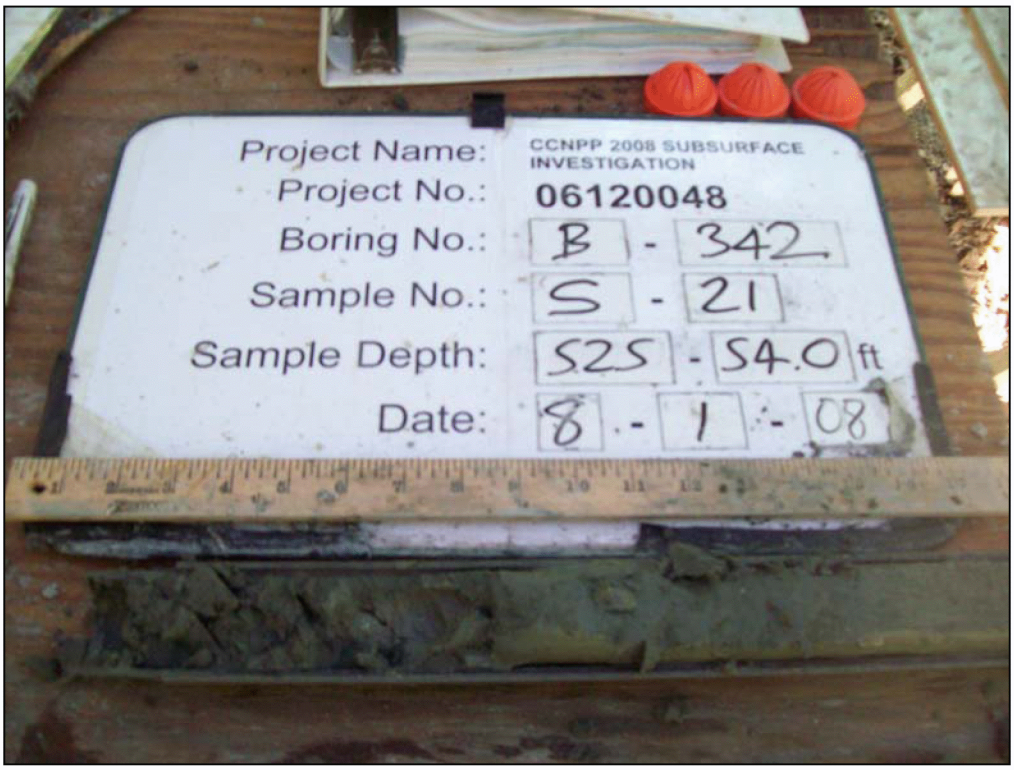
B-342; S-17
42.5 – 44.0 ft

B-342; S-18
45.0 – 46.3 ft



B-342; S-19
47.5 – 49.0 ft

B-342; S-20
50.0 – 51.5 ft



B-342; S-21
52.5 – 54.0 ft

B-342; S-22
55.0 – 56.5 ft

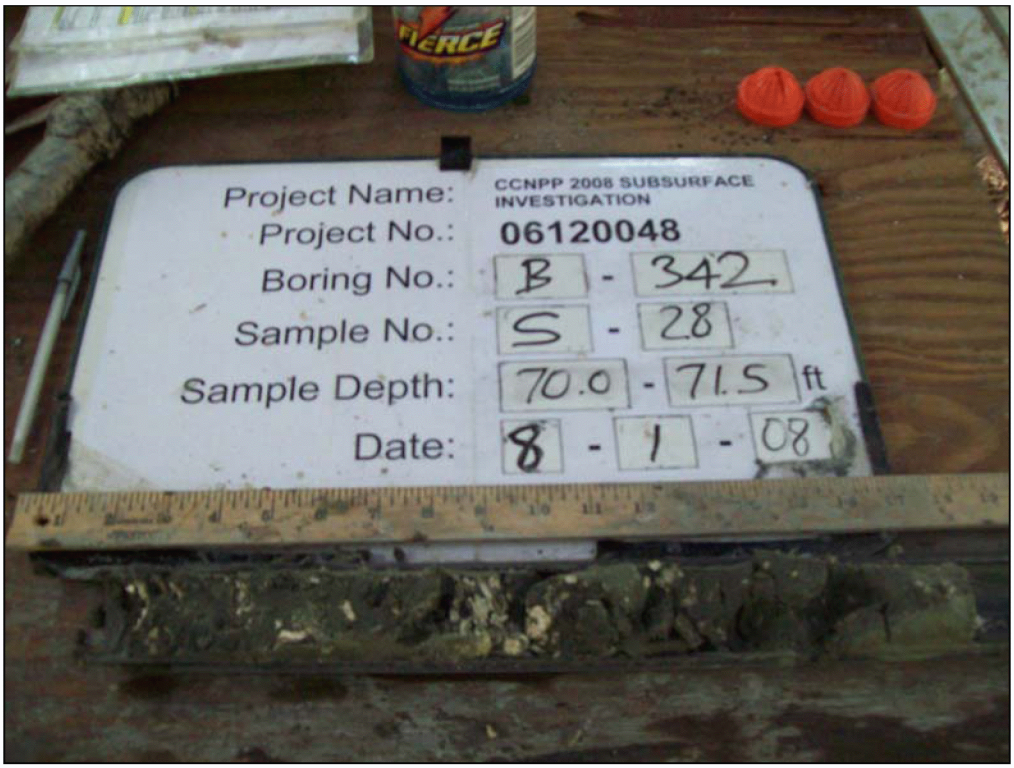
B-342:S-23
57.5 – 59.0 ft

B-342; S-24
60.0 – 60.5 ft

B-342; S-25
62.5 – 64.0 ft

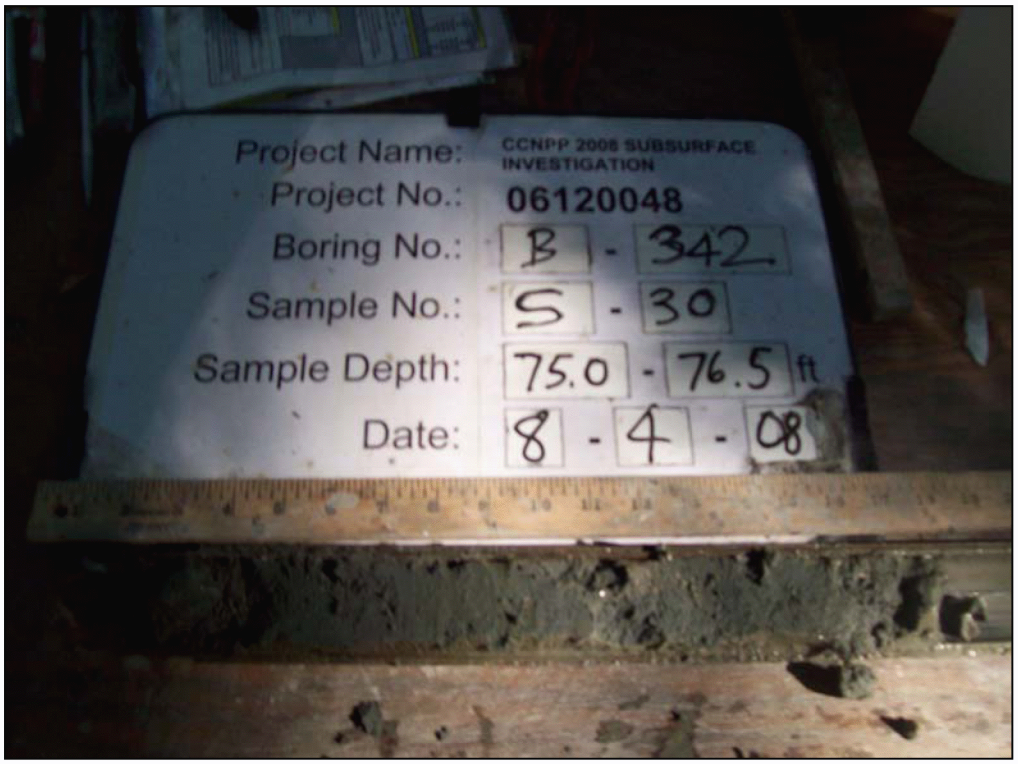
B-342; S-26
65.0 – 66.5 ft

B-342; S-27
67.5 – 69.0 ft



B-342; S-28
70.0 – 71.5 ft

B-342; S-29
72.5 – 72.8 ft

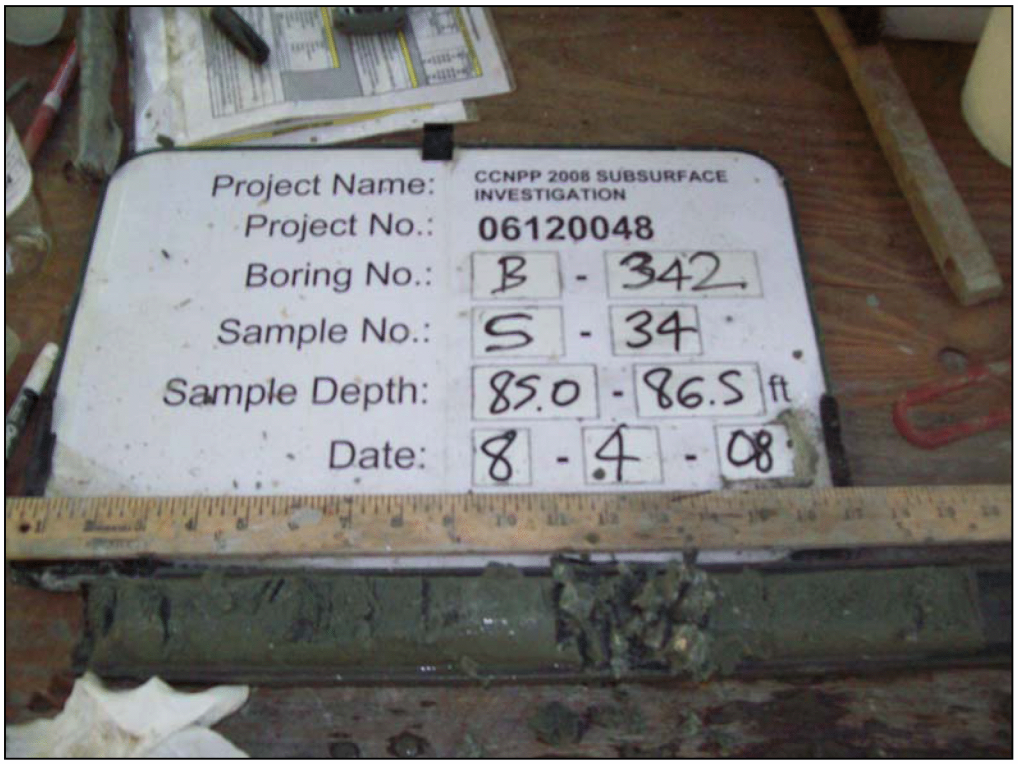


B-342; S-30
75.0 – 76.5 ft

B-342; S-31
77.5 – 79.0 ft

B-342; S-32
80.0 – 81.5 ft

B-342; S-33
82.5 – 84.0 ft



B-342; S-34
85.0 – 86.5 ft