

engineering and constructing a better tomorrow

December 21, 2009

Mr. Richard Baker Project Manager Bechtel Power Corporation 5275 Westview Drive Frederick, MD 21703-8306

Subject:

Final Data Report Transmittal, Revision 0 Geotechnical Exploration and Testing, Supplement 2 Dominion Power North Anna 3 Project Mineral, Louisa County, Virginia MACTEC Project No. 6468-09-2473

Dear Mr. Baker:

MACTEC Engineering and Consulting, Inc., is pleased to submit this Final Data Report Revision 0, for Geotechnical Exploration and Laboratory Testing, Supplement 2, associated with the North Anna 3 Project located in Louisa County, Virginia.

Please do not hesitate to contact us if you have any questions or if we may be of further service.

Sincerely,

MACTEC Engineering and Consulting, Inc.

Stephen J. Criscenzo Project Manager

D. Aforen (D. Steven Copley, PE Project Principal Engineer Virginia Registration No. 019387

MACTEC Engineering and Consulting, Inc. NC License F-0653 3301 Atlantic Avenue • Raleigh, NC 27604 • Phone: 919.876.0416 • Fax: 919.831.8136

Page 1 of 542

D. STEVEN COPLEY No. 019387



COVER SHEET

FINAL DATA REPORT Revision 0

GEOTECHNICAL EXPLORATION AND TESTING SUPPLEMENT 2 DOMINION POWER NORTH ANNA NUCLEAR POWER STATION NORTH ANNA 3 PROJECT MINERAL, LOUISA COUNTY, VIRGINIA

December 16, 2009

Prepared By:

MACTEC ENGINEERING AND CONSULTING, INC. RALEIGH, NORTH CAROLINA

MACTEC PROJECT No. 6468-09-2473

Prepared For:

Bechtel Power Corporation Subcontract No. 25161-500-HC4-CY00-00001

FINAL DATA REPORT Revision 0

GEOTECHNICAL EXPLORATION AND TESTING SUPPLEMENT 2 DOMINION POWER NORTH ANNA NUCLEAR POWER STATION NORTH ANNA 3 PROJECT MINERAL, LOUISA COUNTY, VIRGINIA

December 16, 2009

VOLUME 1

Prepared By:

MACTEC ENGINEERING AND CONSULTING, INC. RALEIGH, NORTH CAROLINA

MACTEC PROJECT No. 6468-09-2473

Prepared For:

Bechtel Power Corporation Subcontract No. 25161-500-HC4-CY00-00001

CONTENTS: Report Text Tables Figure Appendix A – Survey Report Appendix B – Geotechnical Field Data

Volume 1, Revision 0

Page 3 of 542

FINAL DATA REPORT Rev 0 NORTH ANNA 3 PROJECT, SUPPLEMENT 2 TABLE OF CONTENTS

Section 1	Overv	iew	1			
	1.1	Introduction	1			
	1.2	Personnel	2			
	1.3	Organization of Report	2			
	1.4	Quality Assurance	3			
Section 2	Test M	Iethods	4			
	2.1	Surveying	4			
	2.2	Utility Location	4			
	2.3	Drilling Equipment/Methods	5			
	2.4	SPT Energy Measurements	6			
	2.5	Sampling in Geotechnical Borings	7			
	2.6	Boring Logs	8			
	2.7	Sampling in Geotechnical Test Pits (Not Used)	8			
	2.8	Cone Penetrometer Testing (Not Used)	8			
	2.9	Field Electrical Resistivity Testing (Not Used)	8			
	2.10	Geophysical Down-hole Testing	8			
Section 3	Sampl	e Storage	10			
Section 4	Labora	atory Testing – Geotechnical	11			
	4.1	Index Tests - Soil	11			
	4.2	Strength Tests - Rock	11			
	4.3 Reporting					
Section 5	Water Sampling, Field and Laboratory Testing (Section Not Used)					

i

DRAFT DATA REPORT Rev DRAFT NORTH ANNA 3 PROJECT, SUPPLEMENT 2 TABLE OF CONTENTS (CONTINUED)

Tables

	Table 1.1	Organizations Performing Work at the Site or in the Laboratory					
	Table 2.1	Testing Summary - Soil Borings					
	Table 3.1	Summary of Soil Index Test Results					
	Table 4.1	Summary of Laboratory Test Results – Rock					
Figure							
	Figure 1	Site Vicinity Map					
Appendix							
	А	Survey Report					
	В	Geotechnical Field Data					
		B.1 Geotechnical Boring Logs (Soil and Rock)B.2 SPT Energy Measurements Reports					
	С	Geophysical Test Data					
		C.1 Geovision Downhole and P-S Logging Report					
	D	Laboratory Test Data					
		Laboratory Assignment Sheets					
		D.1 Soil Index and Particle Size Distribution Test ReportsD.2 Rock Core Unconfined Strength Test Report					

SECTION 1 OVERVIEW

1.1 Introduction

In 2006, MACTEC Engineering and Consulting, Inc. (MACTEC) was retained by Dominion Nuclear North Anna, LLC (Dominion) to obtain information on subsurface materials and conditions for use in the preparation of the Combined Operating License (COL) Application for North Anna Unit 3. The results from this previous investigation work scope were included in a report titled: Data Report - Geotechnical Exploration and Testing, Revision 0, dated January 23, 2007 (referenced as 2007 Data Report). In 2009, MACTEC was retained by Bechtel Power Corporation (Bechtel) to obtain supplemental information on subsurface materials and conditions for use in the preparation of a potential COL Application for North Anna Unit 3. The COL Application, to be prepared by others, will be submitted to the U.S. Nuclear Regulatory Commission (NRC) for approval to locate a future nuclear electric power generation facility at the existing North Anna Power Station.

This report provides results for activities associated with the authorized scope of work designated by Bechtel as: Subsurface Investigation and Laboratory Testing (Nuclear Safety Related), executed on August 23, 2009.

A site location map for this phase of the project is included as Figure 1.

MACTEC executed its services in accordance with Bechtel Subcontract Number 25161-500-HC4-CY00-00001. The field work covered by this supplemental report commenced on September 1, 2009 and was completed on October 2, 2009. The Scope of Work was defined in Exhibit D of MACTEC Subcontract with Bechtel, and is briefly described below:

- Preparing and submitting a Quality Assurance Project Document, Health and Safety Plan, and detailed Work Plan:
- Obtain permits necessary for performing the work;
- Furnishing all the supervision, labor, equipment, tools, supplies, and materials necessary • to perform the specified work at the locations specified by Bechtel;
- Providing geotechnical engineers and/or geologists in the field under the direction of • qualified geotechnical engineers and/or geologists with the experience in geotechnical investigations to oversee and log the investigation work;
- Providing a site manager responsible for oversight of all required field activities; •
- Providing Quality Assurance (QA) observation of the field and laboratory work activities • and submitting QA records;
- Locating work items by survey methods; •
- Providing water to work areas for drilling and testing; •
- Performing Standard Penetration Tests (SPT) and obtaining samples using a split-barrel • sampler;
- Performing SPT energy measurements: •
- Obtaining rock cores using "H" and "N" size rotary coring methods; •
- Collecting, labeling and transporting soil samples and rock cores to a designated sample • storage area;
- Transporting designated samples to appropriate laboratories for testing purposes; •
- Backfilling drilled holes with cement/bentonite grout using the tremie method;

- Performing down-hole geophysical logging;
- Performing down-hole acoustic televiewer logging;
- Performing Suspension P-S logging;
- Restoring the work areas;
- Performing laboratory testing on soil and rock samples;
- Preparing Draft and Final Data Reports containing the data generated by the subsurface investigation and laboratory testing activities;
- Performing all work under MACTEC's approved Health and Safety Program.

Sampling and testing related to the geotechnical exploration are considered to be tasks that could affect design, construction or operation of safety-related systems, structures and components. This work was performed under a Quality Assurance program that meets the requirements of 10 CFR Part 50 Appendix B and 10 CFR 21(Reporting of Defects and Noncompliance).

1.2 <u>Personnel</u>

MACTEC completed field work for this project under the direction of Bechtel's Site Coordinator, Mr. Thomas Cameron and Dominion's Site Coordinator, Mr. Raj Harnal. Dominion NSS personnel provided utility clearance at boring locations and other site support. Technical support was provided Mr. John Davie (Bechtel) and Mr. Sammy Jabbour (Bechtel). Primary MACTEC personnel and their responsibilities were as follows:

Stephen J. Criscenzo	Project Manager
Scott Auger	Project Coordinator
D. Steven Copley, P.E.	Principal Professional
J. Allan Tice, P.E.	Principal Professional
J. Shane Johnson	Site Manager, Report Preparation
Michael P. Lear	Lead Geologist, Site Safety, Report Preparation
Rodney Clark	Rig Geologist
Kristen Lloyd	Rig Geologist
Chris Baldwin	Rig Geologist
Bill Mabie	Rig Geologist
Adam Mwembeshi	Rig Geologist
Floyd Cox	Drilling Coordinator
R. Keith Pendley	Drilling Coordinator
Mitch Conner	Laboratory Services Manager (MACTEC Raleigh Lab)
Mike Hamlett	Laboratory Services Manager (MACTEC Charlotte Lab)
John Martin	Quality Assurance Representative

The organizations that conducted on-site work or laboratory testing of samples as part of this effort are listed in Table 1.

1.3 Organization of Report

This report and its appendices are organized in the following sequence: the transmittal letter; table of contents, which includes lists of tables and figures; text; tables; and figures. The data are in Appendices and are as follows:

Appendix A – Survey Data

Appendix B – Geotechnical Field Data

- Boring Logs
- SPT Energy Measurement Reports

Appendix C – Geophysical Test Data

Appendix D – Laboratory Test Data

- Soil Index Test Data
- Strength Test Data (Rock)
- 1.4 Quality Assurance

Quality-related activities conducted by MACTEC and its subcontractors during the work presented in this report were in accordance with the MACTEC Quality Assurance Manual and the MACTEC Quality Assurance Project Document. The MACTEC QA program complies with NQA-1-1994, including Subpart 2.20, and the requirements of 10 CFR 50 Appendix B.

SECTION 2 TEST METHODS

2.1 Surveying

The surveying for the project was conducted in two phases by MACTEC's contract surveyor, McKim & Creed of Raleigh, North Carolina. The initial phase was to stake preliminary test locations based on initial coordinates provided on the Bechtel Boring Plan (Drawing No. 500-CY-0010-00001), Rev 0. Boring locations were staked using RTK-GPS when possible. When tree canopy or other obstructions occurred, coordinate traverse points were established using RTK-GPS. Conventional survey was then used to stake planned boring locations from the established traverse points. Wood stakes tied with flagging were used to mark the surveyed locations. After completing an initial assessment of test locations and potential utility and access conflicts, some borings were relocated with concurrence of Bechtel and Dominion personnel.

The second phase of surveying was conducted after completion of the field testing. The surveyor (McKim & Creed) returned to the site and determined locations and elevations of the actual exploration points. The RTK-GPS and conventional survey using a Trimble 5603 DR200+ total station was used to locate the as-drilled boring locations from the traverse points established during the initial phase.

The final survey was performed by Dennis Batzel and Nick Thames and reviewed by William J. Egan, Jr., Land Surveyor, Virginia License No. 002548 of the Raleigh Office of McKim & Creed, P.A. The survey was performed using a Trimble 5700 L1/L2 Real Time Kinematic (RTK) GPS system and Trimble 5603 DR200+ total station. Data was collected and reviewed in Trimble Survey Controller (GPS) and TDS Ranger (total station) data collectors analyzed using Trimble Geomatics Office and Autodesk Land Desktop software. Field notes of occupations and differential leveling were kept as a backup of the data collectors. The equipment was tested prior to and following the survey to ensure the equipment was functioning within the required parameters.

The origin for the as-drilled survey was Control Monument No. 7, a brass disk embedded in concrete. The horizontal positions and vertical values for this point were determined from the submission of 10.5 hours of static GPS observation data to the National Geodetic Survey's (NGS) Online Positioning User Service (OPUS). The static data was collected using the GPS RTK base receiver operating on Control Monument No. 7 from 29 to 30 November 2006. After the OPUS solutions were converted to US Feet (1 meter = 39.37 inches), the position and vertical values for both days were averaged to determine the horizontal position of Control Monument No. 7 within the Virginia State Plane Coordinate System (VSPCS), South Zone, NAD 83 (CORS 96) (EPOCH 2002) and its orthometric height (elevation) relative to NAVD 88 (GEOID 83).

The as-drilled survey locations were provided to Bechtel for their use in creating an as-built drawing of the exploration. The as-built survey locations were also used as input to final boring logs and other tables reporting locations. A complete copy of the surveyor's report can be found in Appendix A. This report includes as-drilled survey data for the Supplement 2 boring locations.

2.2 Utility Location

Representatives of MACTEC used preliminary survey locations and physical features to mark the locations planned for borings. These preliminary locations were provided to Dominion personnel for utility clearance.

Dominion's process for location of underground utilities included notifying Virginia Miss Utility at least 48 hours prior to drilling. After the required 48 hours, Dominion personnel conducted a scan for underground utilities in the vicinity of the staked boring location. Dominion personnel used electromagnetic and ground-penetrating radar methods to check the planned exploration locations for the presence of underground utilities. The planned locations were adjusted as required by Dominion to provide the necessary utility clearances.

After Dominion's scan for utilities was complete, "soft dig" techniques were utilized to assure that there were no utilities present in the top eight feet. Dominion personnel used an air driven probe and a vacuum truck to extend a hole a nominal depth of eight feet below (or to refusal if it occurred above eight feet) existing grades. After completion of the "soft dig" excavation, Dominion personnel signed off utility clearance. The "soft dig" excavation was backfilled with soil cuttings and marked with a wood stake. This method precluded soil sampling to the depth of the "soft dig" hole.

2.3 Drilling Equipment/Methods

MACTEC utilized the following drilling equipment to complete the specified work:

Rig Serial Number	Hammer Serial Number	Owner	Drill Rig	Carrier Type	Driller	Auto Hammer	Rock Core Sizes
269354	MEC-12	MACTEC	CME-45c Track (RAL)	Track	D. Rhodes	Y	NQ
163745	MEC-21	MACTEC	CME-55 Track (RAL)	Track	T. Hahn / F. Cox	Y	HQ
337153	MEC-05	MACTEC	CME-550x (ATL)	ATV	R. Landeros	Y	NQ
331145	MEC-02	MACTEC	CME-55LC Track (RAL)	Track	D. White	Y	HQ
72425	MEC-425	MACTEC	CME-55 Trailer Rig (RAL)	Trailer	P. Pitts	Y	NQ

Table 2.1 summarizes information about the borings. Borings were advanced in soil using rotary wash-drilling techniques until encountering SPT refusal (defined as the physical inability to advance the hole using wash-drilling techniques or 50 blows for one inch or less of penetration, whichever occurred first). Bits used to advance borings to SPT refusal were 2-7/8" or 3-7/8" diameter tricone roller bits with a side discharge. Soil samples from the geotechnical borings were obtained at 2.5-foot and 5-foot intervals as described in Section 2.5. Once SPT refusal was encountered, a steel casing was set, and the holes were advanced using wire-line rock coring equipment and procedures described in ASTM D 2113-08. Rock coring was accomplished utilizing either "HQ" or "NQ" sized core barrels with a split triple tube. Four-inch-diameter casing was used to stabilize the upper portions of the "HQ" sized borings as necessary. Three-inch-diameter casing was used to stabilize the upper portion of the "NQ" sized borings as

necessary. The water introduced into the borehole during drilling and coring was obtained from Lake Anna.

Specific equipment used at each borehole is included on the boring logs included in Appendix **B**.1

The boreholes were backfilled with a cement-bentonite grout prior to demobilizing from the site. As required in Technical Scope of Work Section 3.13, the grout was placed by pumping through a tremie pipe inserted to the bottom of the borehole. The drillers used the grout mixture specified in Technical Scope of Work Section 3.13 (8 gallons of water and 2.5 pounds of bentonite per 94pound sack of cement). A stake or other marker was placed at each completed boring location for later survey use. The as-drilled horizontal coordinates and elevations for each boring are included on Table 2.1, in Appendix A and on the boring logs in Appendix B.1.

2.4 SPT Energy Measurements

The drill rigs utilized on this project used automatic hammers for performing SPT testing. SPT energy measurements were conducted for each of the drill rigs performing SPT soil sampling. Energy measurements were recorded during SPT sampling at the depth intervals shown in Appendix B.2. The length of the drill rod string, including the instrumented drill rod insert for each sample, was generally four feet longer than the depth of the sample being collected.

The energy measurements were performed with a Pile Driving Analyzer (PDA) Model PAK and calibrated accelerometers and strain gauges. A section of drill rod, two feet long and of the same diameter as the drill rod used to advance the boring and instrumented with dedicated strain gauges, was inserted at the top of the drill rod string immediately below the SPT automatic hammer. The inserted rod was also instrumented with two piezoresistive accelerometers that were bolted to the outside of the rod.

The work was conducted in general accordance with ASTM D 4633-05. The strain and acceleration signals were converted to force and velocity by the PDA, and the data were interpreted by the PDA according to the Case Method equation. The EFV method of energy calculation is recommended in ASTM D 4633-05. The maximum energy transmitted to the drill rod string (as measured at the location of the strain gauges and accelerometers) was calculated by the PDA using the following EFV method equation:

 $EFV = \int F(t) * V(t) * dt$

Where: EFV = Transferred energy (EFV equation), or Energy of FV F(t) = Calculated force at time t V(t) = Calculated velocity at time tdt = time differential (integral taken with respect to time)

The EFV equation, integrated over the complete wave event, measures the total energy content of the event using both force and velocity measurements. The EFV values associated with each blow analyzed were tabulated and averaged to obtain the average measured energy at each depth tested. The ratio of the average measured energy to the theoretical potential energy of the SPT system (140 lb. weight with the specified 30-inch fall) is the energy transfer ratio (ETR).

The average ETR measured for each rig ranged from 81.0% to 87.4% of the theoretical potential energy. These ETR values are within the range of typical values for automatic hammers. The ETR values (as a percent of the theoretical value) are shown in Appendix B.2.

2.5 <u>Sampling in Geotechnical Borings</u>

2.5.1 Standard Penetration Test Sampling

SPT sampling in the geotechnical borings was generally conducted on 2.5-foot centers from the ground surface to a depth of 15 feet. The SPT sampling interval below 15 feet was 5 feet to the depth of boring termination or to SPT refusal. No sampling was done in the zone where the "soft dig" utility clearance method, as described in Section 2.2, was performed. The sampling equipment and methods are described in ASTM D 1586-08a. Automatic hammers were used to perform the SPT tests. The split-barrel sampler was typically driven 18 inches in soil with blows recorded for each six-inch interval of penetration. The weight of the hammers used at the site ranged from 138.6 to 139.5 pounds, meeting ASTM requirements. In very hard soils or weathered rock, driving was terminated after 50 blows and the actual penetration was recorded, (e.g., 50 blows/0.3 feet). At selected locations where low penetration was encountered, the sampler was over-driven to collect additional sample.

The split-barrel sampler was opened at the drill site and the recovered materials were visually described, classified, and photographed by MACTEC's rig geologist or engineer. A selected portion of the sample was placed in a glass sample jar with a moisture-proof lid. Sample jars were labeled, placed in cardboard boxes, and transported to the on-site secure sample storage facility at the end of each work day.

2.5.2 Rock Core Sampling

The Technical Scope of Work defined SPT refusal as 50 blows for 6 inches or less of penetration. For purposes of determining the depth at which to begin rock coring procedures, refusal to soil drilling was defined as physical inability to advance the hole using wash drilling procedures. In practice, the sampler was typically struck with 50 blows and the actual penetration measured and recorded on the boring logs. Rock coring was completed in accordance with ASTM D 2113-08.

Rock recovered by the coring process was carefully removed from the inner barrel and placed in wooden core boxes with wooden blocks used to mark ends of runs. When core recovery was less than 100%, the rig geologist placed foam, PVC, or wood spacers in the core box to stabilize the core laterally. Filled core boxes were taken to the on-site secure sample storage facility. Photographs of the cores were taken in the field.

The rig geologist visually described the core and noted the presence of joints and factures, distinguishing mechanical breaks from natural breaks where possible. The rig geologist also calculated percent recovery and Rock Quality Designation (RQD) prior to moving the core from the drill site. Field boring logs and photographs were used to document the drilling operations and recovered materials, and are retained in the MACTEC Document Control Center (DCC).

2.5.3 Intact Soil Sampling

No intact soil samples were obtained during the specified scope of work.

7

2.6 Boring Logs

The soil descriptions on the boring logs in Appendix B.1 are based on the field descriptions (ASTM D 2488-09a) by the rig geologist or engineer modified according to ASTM 2487-06e1 where lab tests results are available. The rock core descriptions on the boring logs in Appendix B.1 are based on the rig geologist's or rig engineer's description. In addition to classification and logging of the bedrock lithology, rock discontinuities were described and logged, and the Rock Quality Designation (RQD) was measured and recorded for each core run according to ASTM D 6032-08. The water depths on the boring logs are from observations during drilling. Because water was introduced during rotary and core drilling, the water depths on the boring logs may not represent the stabilized water depths. The boring logs in Appendix B.1 were prepared using Version 8 of the computer program "gINT".

2.7 Sampling in Geotechnical Test Pits

No test pits were completed during the specified scope of work.

2.8 **Cone Penetrometer Testing**

No cone penetrometer testing was completed during the specified scope of work.

2.9 Field Electrical Resistivity Testing

No field resistivity testing was completed during the specified scope of work.

2.10 Geophysical Down-hole Testing

Down-hole geophysical and televiewer logging was performed in two borings (M-10 (DH) and M-30 (DH)) as indicated on the Bechtel Boring Location Plan (Drawing No. 500-CY-0010-00001, Rev 0). P-S suspension logging was conducted in the same boreholes. GEOVision, a MACTEC subcontractor, conducted the down-hole geophysical logging in accordance with ASTM D 5753-05. The results are found in the report from GEOVision contained in Appendix C.1. The GEOVision report consists of two volumes -a text and graphical volume presented in Appendix C.1, and an electronic set of data and charts presented only on DVD and not included in paper copies of this Geotechnical Data Report. The down-hole geophysical logs performed in the selected borings are described below.

2.10.1 Natural Gamma

Gamma logs record the amount of natural gamma radiation emitted by the soil and rocks surrounding the boring.

2.10.2 Long and Short Normal Resistivity

Normal-resistivity logs record the electrical resistivity of the borehole environment and surrounding soil, rocks and water as measured by variably spaced potential electrodes on the logging probe. Typical spacing for potential electrodes is 16 inches for short-normal resistivity and 64 inches for long normal resistivity. Normal resistivity logs are affected by bed thickness, borehole diameter and borehole fluid, and can only be collected in water or mud filled open holes.

8

2.10.3 Three Arm Caliper

Caliper logs record borehole diameter. Changes in borehole diameter are related to boring construction, such as casing or drilling bit size, and to fracturing or caving along the borehole wall. Because borehole diameter commonly affects log response, the caliper log may be useful in the analysis of other geophysical logs.

2.10.4 Borehole Acoustic Televiewer Logging

Televiewer logging was conducted in accordance with GEOVison procedures as included in the MACTEC Work Plan. The acoustic televiewer measures amplitude and travel time of the reflected acoustic signal and produces a magnetically oriented photographic image of the acoustic reflectivity of the boring wall. The acoustic televiewer is limited to open boreholes filled with water or drilling mud.

2.10.5 Suspension P-S Velocity Logging

Suspension P-S velocity logging was conducted in borings M-10 (DH) and M-30 (DH) in accordance with GEOVision procedures as contained in the MACTEC Work Plan. Measurements of compression (P) and shear (S) wave velocity were made at 1-meter intervals or less.

9

SECTION 3 SAMPLE STORAGE

Consistent with MACTEC's QAPD Requirements, a temporary on-site secure sample storage facility was established. The storage facility was a lockable climate controlled trailer. The trailer was a ground supported 20-foot-long by 8-foot wide Mobile-Mini Open Bay Security Office with high security door system and exterior security bars over each window.

Samples were transported daily from the field to the temporary on-site secure sample storage facility by the rig geologists/engineers. The SPT samples were transported in accordance with ASTM D 4220-95(2007) for Group B samples. The SPT samples were transported in their compartmentalized cardboard box each labeled to show the contents therein. The rock cores were transported in their wooden core boxes, kept horizontal and each labeled to show the contents. A sample inventory log was kept at the temporary on-site secure sample storage facility. All samples entering the temporary on-site secure sample storage facility were logged in by the Rig Geologist/Engineer or Site Manager/ Lead Geologist.

Samples were reviewed by the Lead Geologist and transported from the temporary on-site secure sample storage facility to the long term on-site sample storage facility located at the plant's warehouse. The long term sample storage facility was located within the "A Level" area of the plant's warehouse facility. The "A Level" has limited access and is climate controlled. Samples were stored in either a 12-foot square area surrounded by a 6-foot high chain link fence, or in an adjacent "fixed" secured area provided by the plant. Locking gates were provided in both areas.

A MACTEC Chain-Of-Custody form was completed for all samples removed from the temporary on-site secure sample storage facility. A Dominion representative received samples at the long term on-site sample storage facility on November 2, 2009.

SECTION 4 LABORATORY TESTING – GEOTECHNICAL

Laboratory testing was conducted on disturbed soil samples and on rock cores obtained during the subsurface investigation. All testing was performed in accordance with the current ASTM standards or other standards where applicable. Selection of the samples to be tested and the tests to be performed on the samples was done by Bechtel engineers. Bechtel provided a Geotechnical Laboratory Test Assignment Sheet (Assignment 01) dated September 21, 2009 for geotechnical soil and rock laboratory testing.

Some of the rock cores on which tests were assigned contained fractures or geometric characteristics that made them unsuitable to test. This information was reported to the Bechtel on-site Technical Representative. A representative of MACTEC and the Bechtel on-site Technical Representative determined the rock core interval closest to the assigned depth interval suitable for testing. Replacement rock core test intervals were assigned by Bechtel. A revised copy of the Geotechnical Laboratory Assignment Sheet (Assignment 01, Rev 1) dated September 28, 2009 showing revised rock core depths is included in Appendix D.

Testing of soil samples and rock core were conducted in MACTEC's laboratories in Raleigh and Charlotte, North Carolina, respectively.

The following tests were assigned and performed:

4.1 Index Tests - Soil

- Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass -ASTM D 2216-05
- Particle-Size Analysis of Soils ASTM D 422-63(2007) (for analysis including hydrometer)
- Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis ASTM D 6913-(2004)e1 (for analysis not including hydrometer)
- Liquid Limit, Plastic Limit, and Plasticity Index of Soils ASTM D 4318-05
- Classification of Soils for Engineering Purposes (Unified Soil Classification System) -ASTM D 2487-06e1
- Description and Identification of Soils (Visual-Manual Procedure) ASTM D 2488-09a

4.2 Strength Tests - Rock

- Specimen Preparation ASTM D 4543-08
- Compressive Strength ASTM D 7012-07e1

4.3 Reporting

The geotechnical laboratory test reports, consisting of individual test data and results sheets as required by the testing standard, are contained in Appendix D. Summaries of the test results in Appendix D are shown in Table 3.1 for soil and Table 4.1 for rock.

SECTION 5 WATER SAMPLING, FIELD AND LABORATORY TESTING

No water sampling or testing was completed during the specified scope of work.

FINAL DATA REPORT Revision 0 GEOTECHNICAL EXPLORATION AND TESTING SUPPLEMENT 2 DOMINION POWER NORTH ANNA NUCLEAR POWER STATION NORTH ANNA 3 PROJECT MINERAL, LOUISA COUNTY, VIRGINIA

December 16, 2009

VOLUME 1

TABLES

Prepared By:

MACTEC ENGINEERING AND CONSULTING, INC. RALEIGH, NORTH CAROLINA

MACTEC PROJECT No. 6468-09-2473

Prepared For:

Bechtel Power Corporation Subcontractor No. 25161-500-HC4-CY00-00001

TABLE 1.1 ORGANIZATIONS PERFORMING WORK AT THE SITE OR IN THE LABORATORY

Organization	Function
MACTEC Engineering and Consulting, Inc.	 Underground Utility Clearance (Not Used) Geotechnical Borings with SPT Tests and Rock Coring SPT Energy Measurement on Drill Rigs Logging of Geotechnical Borings Undisturbed Sampling (Not Used) Bulk Sampling (Not Used) Boring Abandonment Site Coordination Geotechnical Laboratory Testing for Soil
GEOVision	Samples and Rock Core
GEO VISIOII	 Down-hole Geophysical Logging P-S Suspension Logging
McKim&Creed, P.A.	Surveying of Boring Locations

Original Prepared By: JSJ 12/16/09 (Rev 0)

Original Checked By: SJC 12/16/09 (Rev 0)

TABLE 2.1 TESTING SUMMARY - BORINGS North Anna 3 Project, Supplement 2 MACTEC Project Number 6468-09-2473																
Boring Type			Equipment	Dep	th	As-Built Coordinates/Elevations			In-Situ Testing							
Boring Number	Boring Number SPT Core UD Tubes		Drill Rig	Hammer ID	Hammer ID Proposed (ft) Actual (ft)		Northing (US ft) Easting (US ft) Ground Surface Elevation (ft)		P-S Suspension	Televiewer and Deviation	Natural Gamma	Resistivity	Caliper	Spontaneous Potential		
M-1	x	x	NA	CME 550X (ATL)	MEC-05	150	151.1	3,909,611.0	11,685,483.5	314.1	NA	NA	NA	NA	NA	NA
M-1	X	X	NA	CME 550X (ATL)	MEC-05	150	153.4	3,909,531.0	11,685,586.0	315.3	NA	NA	NA	NA	NA	NA
M-3	X	X	NA	CME 55LC Track (RAL)	MEC-03	150	152.6	3,909,538.5	11,685,678.5	313.9	NA	NA	NA	NA	NA	NA
M-4	x	x	NA	CME 550X (ATL)	MEC-05	150	154.0	3,909,456.0	11,685,694.5	321.8	NA	NA	NA	NA	NA	NA
M-6	x	x	NA	CME 55 Track (RAL)	MEC-21	150	150.4	3,909,401.0	11,685,759.5	327.8	NA	NA	NA	NA	NA	NA
M-7	X	X	NA	CME 55 Trailer (RAL)	MEC-425	150	151.5	3,909,504.0	11,685,835.5	326.0	NA	NA	NA	NA	NA	NA
M-8	X	X	NA	CME 45C Track (RAL)	MEC-12	150	150.6	3,909,413.5	11,685,847.0	329.3	NA	NA	NA	NA	NA	NA
M-9	X	X	NA	CME 550X (ATL)	MEC-05	150	153.6	3,909,333.5	11,685,946.0	327.3	NA	NA	NA	NA	NA	NA
M-10 (DH)	х	х	NA	CME 55LC Track (RAL)	MEC-02	200	201.9	3,909,243.5	11,685,962.0	323.6	х	х	x	х	х	х
M-11	х	NA	NA	CME 55 Trailer (RAL)	MEC-425	150	148.7	3,909,351.5	11,686,038.5	325.9	NA	NA	NA	NA	NA	NA
M-12	х	х	NA	CME 45C Track (RAL)	MEC-12	150	151.2	3,909,723.0	11,685,560.0	307.0	NA	NA	NA	NA	NA	NA
M-13	х	х	NA	CME 55LC Track (RAL)	MEC-02	150	151.6	3,909,519.5	11,686,025.0	326.8	NA	NA	NA	NA	NA	NA
M-14	х	NA	NA	CME 55LC Track (RAL)	MEC-02	60	60.3	3,909,451.5	11,686,111.0	323.8	NA	NA	NA	NA	NA	NA
M-15	х	NA	NA	CME 45C Track (RAL)	MEC-12	60	60.0	3,909,531.0	11,686,166.0	311.3	NA	NA	NA	NA	NA	NA
M-16	х	х	NA	CME 55 Track (RAL)	MEC-21	60	61.9	3,909,989.5	11,685,801.5	284.6	NA	NA	NA	NA	NA	NA
M-17	х	х	NA	CME 55 Trailer (RAL)	MEC-425	150	151.9	3,909,775.0	11,686,213.5	306.2	NA	NA	NA	NA	NA	NA
M-18	х	NA	NA	CME 45C Track (RAL)	MEC-12	60	60.4	3,909,608.0	11,686,213.5	304.2	NA	NA	NA	NA	NA	NA
M-19	х	х	NA	CME 550X (ATL)	MEC-05	150	151.4	3,910,052.5	11,685,855.5	280.4	NA	NA	NA	NA	NA	NA
M-20	х	х	NA	CME 45C Track (RAL)	MEC-12	150	151.0	3,909,793.5	11,686,067.5	302.6	NA	NA	NA	NA	NA	NA
M-21	х	х	NA	CME 55 Track (RAL)	MEC-21	150	151.8	3,909,811.0	11,686,269.5	303.9	NA	NA	NA	NA	NA	NA
M-27	х	х	NA	CME 55 Trailer (RAL)	MEC-425	150	151.4	3,909,426.0	11,685,937.5	330.2	NA	NA	NA	NA	NA	NA
M-28	х	х	NA	CME 45C Track (RAL)	MEC-12	150	150.0	3,909,635.5	11,685,672.0	308.2	NA	NA	NA	NA	NA	NA
M-29	х	х	NA	CME 550X (ATL)	MEC-05	150	151.2	3,909,710.5	11,685,460.0	309.3	NA	NA	NA	NA	NA	NA
M-30(DH)	х	х	NA	CME 55 Track (RAL)	MEC-21	200	201.7	3,909,695.0	11,685,381.5	313.3	х	х	х	х	х	х
M-31	х	х	NA	CME 55 Track (RAL)	MEC-21	150	151.5	3,909,799.0	11,685,459.5	306.9	NA	NA	NA	NA	NA	NA
M-32	х	х	NA	CME 55 Track (RAL)	MEC-21	60	62.2	3,909,875.5	11,685,526.5	313.2	NA	NA	NA	NA	NA	NA
M-33	х	NA	NA	CME 55LC Track (RAL)	MEC-02	60	64.9	3,909,983.5	11,685,614.5	303.8	NA	NA	NA	NA	NA	NA
M-34	х	х	NA	CME 55LC Track (RAL)	MEC-02	60	63.0	3,910,122.0	11,685,736.0	280.9	NA	NA	NA	NA	NA	NA

TABLE 2.1

NOTES: NA = Not Applicable ft bgs = feet below ground surface

Horizontal Coordinates (Norofinates (Norofinates and Easting) = NAD83 (2007), Virginia State Plane Coordinate System (VSPCS) South Zone, NAD 83 (CORS 96), (EPOCH 2002), U.S. Survey Feet Elevations = North American Vertical Datum of 1988 (NAVD88), U.S. Survey Feet

Volume 1, Revision 0

Original Prepared by: JSJ (Rev 0)

Original Checked by: DSC (Rev 0)

TABLE 3.1 SUMMARY OF SOIL INDEX TEST RESULTS SPLIT-BARREL SAMPLES NORTH ANNA 3 PROJECT, SUPPLEMENT 2 MACTEC PROJECT NO. 6468-09-2473

Boring Number	Sample Number	Depth (ft)	Gravel (%)	Sand (%)	Fines (%)	Silt (%)	0.005 mm Clay (%)	USCS Symbol	Natural Moisture (%)	LL (%)	РІ (%)	Gs
M-10 (DH)	SS-2	11.7-13.2	0.0	57.5	42.5	30.2	12.3	SM	48.5	59	9	
M-10 (DH)	SS-4	19.2-20.7	0.0	61.9	38.1	29.4	8.7	SM	35.9	54	6	
M-10 (DH)	SS-5	24.2-25.7	0.0	61.3	38.7	28.4	10.3	SM	53.7	59	12	
M-10 (DH)	SS-6	29.2-30.7	0.0	56.6	43.4	31.9	11.5	SM	66.7	51	7	
M-10 (DH)	SS-8	39.1-40.6	0.0	53.5	46.5	42.4	4.1	SM	30.6	42	6	
M-10 (DH)	SS-10	49.1-50.6	0.0	79.9	20.1			SM ¹	16.4			
M-10 (DH)	SS-12	59.1-60.6	0.7	77.2	22.1			SM ¹	15.1			
M-10 (DH)	SS-15	74.1-75.6	0.0	72.6	27.4			SM ¹	29.9			
M-10 (DH)	SS-17	84.1-85.6	0.0	79.0	21.0			SM ¹	15.1			
M-30 (DH)	SS-1	8.7-10.2	0.6	72.3	27.1			SM ¹	17.0			
M-30 (DH)	SS-3	13.7-15.2	0.0	64.0	36.0			SM ¹	19.8			
M-30 (DH)	SS-5	23.7-25.2	0.0	82.0	18.0			SM ¹	18.5			
M-30 (DH)	SS-7	33.7-35.2	0.0	77.1	22.9			SM ¹	14.8			
	1 Classification is based on quantitative and qualitative (visual inspection) information. LL= Liquid Limit, PI = Plasticity Index, G _s = Specific Gravity Test not assigned											

TABLE 4.1 SUMMARY OF LABORATORY TEST RESULTS - ROCK UNCONFINED COMPRESSIVE STRENGTH TEST RESULTS NORTH ANNA 3 PROJECT, SUPPLEMENT 2

Boring Number	Run Number	Lab Sample ID	Sample Top Depth (feet)	Sample Length (L) (inches)	Sample Diameter (D) (inches)	L/D Ratio	Unit Weight (pcf) ⁽¹⁾	Moisture Content (%)	Type of Break (2)	Compressive	Young's Modulus (ksi x1000)	Specific Gravity
M-10 (DH)	R-7	RS-1	117.45	5.15	2.41	2.1	160.1		S	7960		
M-10 (DH)	R-10	RS-2	133.75	5.09	2.41	2.1	161.9		S	19640 ⁽⁴⁾		
M-10 (DH)	R-15	RS-3	153.70	5.08	2.41	2.1	163.5		С	33830 ⁽⁴⁾		
M-10 (DH)	R-20	RS-4	177.60	5.14	2.39	2.2	163.3		S	20880 ⁽⁴⁾		
M-10 (DH) ⁽³⁾	R-24	RS-5	196.70	5.18	2.39	2.2	163.7		С	30780		
M-30 (DH) ⁽³⁾	R-4	RS-6	57.00	5.18	2.40	2.2	162.8		С	28650		
M-30 (DH)	R-18	RS-7	95.40	5.06	2.39	2.1	162.7		С	23700		
M-30 (DH) ⁽³⁾	R-26	RS-8	134.90	5.26	2.39	2.2	163.7		S	26200		
M-30 (DH)	R-34	RS-9	166.90	5.06	2.40	2.1	164.6		C/S	24820		
M-30 (DH)	R-40	RS-10	197.05	5.16	2.40	2.2	162.6		С	33040		

(1) As-tested Wet Unit Weight.

(2) Types of Breaks: COL=Columnar; C=Cone; S=Shear; C/S=Cone/Shear

(3) Core samples did not meet the dimensional tolerances for straightness or perpendicularity per ASTM D 4543-08.

(4) Test duration exceeded 15 minute maximum time as indicated by ASTM D 7012-07e1.

(5) Shaded cells indicate that information not obtained.

NA = Not Applicable

FINAL DATA REPORT Revision 0 GEOTECHNICAL EXPLORATION AND TESTING SUPPLEMENT 2 DOMINION POWER NORTH ANNA NUCLEAR POWER STATION NORTH ANNA 3 PROJECT MINERAL, LOUISA COUNTY, VIRGINIA

December 16, 2009

VOLUME 1

FIGURE

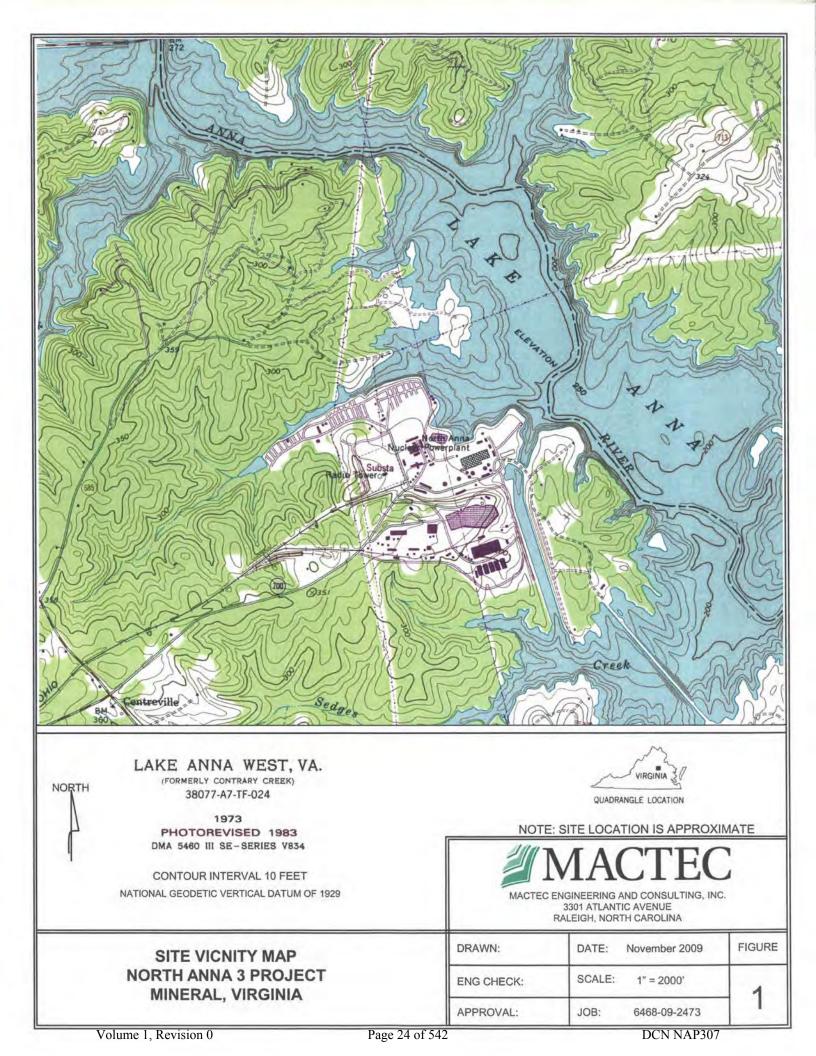
Prepared By:

MACTEC ENGINEERING AND CONSULTING, INC. RALEIGH, NORTH CAROLINA

MACTEC PROJECT No. 6468-09-2473

Prepared For:

Bechtel Power Corporation Subcontractor No. 25161-500-HC4-CY00-00001



FINAL DATA REPORT Revision 0 GEOTECHNICAL EXPLORATION AND TESTING SUPPLEMENT 2 DOMINION POWER NORTH ANNA NUCLEAR POWER STATION NORTH ANNA 3 PROJECT MINERAL, LOUISA COUNTY, VIRGINIA

December 16, 2009

VOLUME 1

APPENDIX A Survey Report

Prepared By:

MACTEC ENGINEERING AND CONSULTING, INC. RALEIGH, NORTH CAROLINA

MACTEC PROJECT No. 6468-09-2473

Prepared For:

Bechtel Power Corporation Subcontractor No. 25161-500-HC4-CY00-00001

MACTEC

DOCUMENTATION OF TECHNICAL REVIEW SUBCONTRACTOR WORK PRODUCT

Project Name: NORTH ANNA 3 PROJECT

Project Number: 6468-09-2473

Project Manager: Steve Criscenzo

Project Principals: Al Tice and Steve Copley

The report described below has been prepared by the named subcontractor retained in accordance with the MACTEC QAPD. The work and report have been reviewed by a MACTEC technically qualified person. Comments on the work or report, if any, have been satisfactorily addressed by the subcontractor. The attached report is approved in accordance with section QS-7 of MACTEC's QAPD.

The information and date contained in the attached report are hereby released by MACTEC for project use.

REPORT: Surveyor's Report for 29 Soil Borings, As-Drilled Location Survey - North

Anna Nuclear Power Plant, dated October 23, 2009, Revised November 19, 2009

SUBCONTRACTOR: McKim & Creed, P.A.

DATE OF ACCEPTANCE: November 23, 2009

TECHNICAL REVIEWER:

D. Steven Copley, P.E., Principal Professional

PRINCIPAL PROFESSIONAL: D. Stower Copley 11-23-09

DCN - NAP 295





ENGINEERS SURVEYORS PLANNERS

October 23, 2009 Revised November 19, 2009

Mr. Scott Auger, P.E., PMP MACTEC Engineering and Consulting, Inc. 3301 Atlantic Avenue Raleigh, NC 27604

Ref: Surveyor's Report for 29 Soil Borings, As-Drilled Location Survey – North Anna Nuclear Power Plant

Dear Mr. Auger:

McKim & Creed, P.A. performed an as-drilled survey of 29 soil borings (M1-M4, M6-M21, M25, M27-M34), on the dates of October 6th, 7th and 8th, 2009. The survey was performed in accordance with the specifications stipulated in *"Work Order & PO NO 200913023, North Anna 3 Project, MACTEC Project No. 6468092473-12"*, dated August 24, 2009 including the QA requirements in Section 2.0 of the Bechtel Technical Specification, and Attachment 1 – Survey Controls from the MACTEC Geotechnical Work Plan. As required by the Bechtel Technical Specification, Section 2.2, as-drilled boring locations shown in this report have a horizontal accuracy to the nearest 0.5 foot and a vertical accuracy to the nearest 0.1 foot.

The survey was performed using a Trimble 5700 L1/L2 Real Time Kinematic (RTK) GPS system and Trimble 5603 DR200+ total station. Data was collected and reviewed in Trimble Survey Controller (GPS) and TDS Ranger (total station) data collectors analyzed using Trimble Geomatics Office and Autodesk Land Desktop softwares. Hard copy field notes of occupations and results were kept as a backup of the data collectors. The equipment was tested for functionality prior to and following conducting the survey to ensure the equipment was functioning within the required parameters.

Venture IV Building

Suite 500

1730 Varsity Dríve Raleigh, NC 27606 The origin for the stakeout survey was Control Monument No. 7, a brass disk embedded in concrete. The horizontal positions and vertical values for this point were determined from the submission of 10.5 total hours of static GPS observation data to the National Geodetic Survey's (NGS) Online Positioning User Service (OPUS). The static data was collected using the GPS RTK base receiver operating on Control Monument No. 7 from 29 through 30 November

Fax 919.233.8031

919,233.8091

www.mckimcreed.com

DCN# NAP296

29 Borings As Drilled Page 1 of 7 2006. After the OPUS solutions were converted to US Feet (1 meter = 39.37 inches), the position and vertical values for both days were averaged to determine the horizontal position of Control Monument No. 7 within the Virginia State Plane Coordinate System (VSPCS), South Zone, NAD 83 (CORS 96) (EPOCH 2002) and its orthometric height (elevation) relative to NAVD 88 (GEOID 03). Final coordinates:

Monument 7	Jan 07 OPUS Position
Northing	3,909,874.97 usft
Easting	11,685,943.52 usft

Orthometric Height 303.76 usft

The base station for the RTK system was positioned on Monument No. 7 during all RTK sessions. An additional 5 hours of static data was collected in August 2009 to verify the location of monument 7 and ensure that it had remained stable since the original observations. RTK checks were made on the existing monuments A and B using coordinate values provided on Boring Location Plan 9-CY-0010-00001. Checks were performed in the morning and afternoon of each survey session. Fixed height poles were used with all the GPS units to ensure vertical accuracy. Checks were performed in the morning and the afternoon. Additionally, over four hours of static GPS observations were made on GPS Control Point 105 as a check on the integrity of the overall control network. Final coordinates:

Point 105

Oct 09 NAD83 Position

3,910,088.59 usft

Northing

Easting

11,685,845.35 usft

Orthometric Height 279.45 usft

Also, RTK GPS observations to existing monuments A and B were performed. Their positions in the coordinate system established for this survey are:



29 Borings As Drilled Page 2 of 7

Page 28 of 542

Monument A	Oct 09 NAD83 Position
Northing	3,909,133.04 usft
Easting	11,686,566.77 usft
Orthometric Height	327.68 usft
Monument B	Oct 09 NAD83 Position
Northing	3,909,594.84 usft
Easting	11,686,608.38 usft
Orthometric Height	329.08 usft

All points located conventionally by the total station were set from RTK 3-minute observed control points. Every occupation of RTK control points with the total station was checked using the backsight confirmation routine of the data collector. The backsights were taken in the direct and reversed position. This ensured accurate instrument and target/prism pole height and relative accuracy between points. Elevations of the as-drilled positions were measured from natural ground at the drill site.

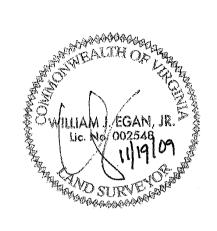
A closed level loop was run through the control points to provide additional validation of elevations.

Based upon the methods employed and the quality of the data collected, the undersigned certifies that the relative accuracy of the data set resulting from this survey meets the accuracy requirements stipulated by MACTEC, Inc. and Bechtel Corp. for the final horizontal location of exploration points.

DCN# NAP296



Page 29 of 542



Regards Bill Egad, PE LS

Project Manager

<u>Encl:</u>

1 -- Tabular As-Drilled Position Data

2-- OPUS solution (Point 105)



10/23/2009 Enclosure 1

As-Drilled Boring Locations North Anna Nuclear Power Plant

Borehole	Drilled	Drilled	Ground
Designation	Northing (Y)	Easting (X)	Elev.
M-01	3909611.0	11685483.5	314.1
M-02	3909531.0	11685586.0	315.3
M-03	3909538.5	11685678.5	313.9
M-04	3909456.0	11685694.5	321.8
M-06	3909401.0	11685759.5	327.8
M-07	3909504.0	11685835.5	326.0
M-08	3909413.5	11685847.0	329.3
M-09	3909333.5	11685946.0	327.3
M-10 (DH)	3909243.5	11685962.0	323.6
M-11	3909351.5	11686038.5	325.9
M-12	3909723.0	11685560.0	307.0
M-13	3909519.5	11686025.0	326.8
M-14	3909451.5	11686111.0	323.8
M-15	3909531.0	11686166.0	311.3
M-16	3909989.5	11685801.5	284.6
M-17	3909775.0	11686213.5	306.2
M-18	3909608.0	11686213.5	304.2
M-19	3910052.5	11685855.5	280.4
M-20	3909793.5	11686067.5	302.6
M-21	3909811.0	11686269.5	303.9
M-25	***M-25 NOT BORED		
M-27	3909426.0	11685937.5	330.2
M-28	3909635.5	11685672.0	308.2
M-29	3909710.5	11685460.0	309.3
M-30 (DH)	3909695.0	11685381.5	313.3
M-31	3909799.0	11685459.5	306.9
M-32	3909875.5	11685526.5	313.2
M-33	3909983.5	11685614.5	303.8
M-34	3910122.0	11685736.0	280.9

Note: All locations based on VA State Plane Coordinates NAD83 (CORS96 Epoch 2002) Zone 4502 South (US Feet) horizontal and NAVD88 (Geoid03) vertical. DCN# NAP296

29 Borings As Drilled Page 5 of 7 FILE: 75812803.DAT 000129896

NGS OPUS SOLUTION REPORT

All computed coordinate accuracies are listed as peak-to-peak values. For additional information: www.ngs.noaa.gov/OPUS/Using OPUS.html#accuracy DATE: October 16, 2009 USER: dclark@mckimcreed.com TIME: 12:05:14 UTC RINEX FILE: 7581280t.090 START: 2009/10/07 19:45:00 SOFTWARE: page5 0909.08 master28.pl 081023 STOP: 2009/10/07 21:51:00 EPHEMERIS; igr15523.eph [rapid] OBS USED: 5200 / 5260 : 99% NAV FILE: brdc2800.09n : 88% 28 / 32 # FIXED AMB: NONE ANT NAME: TRM41249.00 OVERALL RMS: 0.017(m) ARP HEIGHT: 2 ITRF00 (EPOCH: 2009.7668) REF FRAME: NAD_83(CORS96) (EPOCH: 2002.0000) 0.101(m)0.101(m)1063035.560(m) 1063036,293(m) X -4914752.290(m) 0.115(m)-4914753.745(m) 0.115(m)Y: 0,106(m) 3910676,007(m) 0.106(m)3910676.131(m) 2.1 0.079(m) 38 3 34,11903 38 3 34,09066 0.079(m) LAT: 0.076(m) 282 12 17.18019 282 12 17,19696 0.076(m)E LON: 0.076(m) 77 47 42,81981 0.076(m)W LON: 77 47 42,80304 0.163(m) 51.645(m) 52,964(m) 0.163(m)EL HGT: 0.171(m) [NAVD88 (Computed using GEOID03)] ORTHO HGT: 85.291 (m) STATE PLANE COORDINATES UTM COORDINATES SPC (4502 VA S) UTM (Zone 18) 1191797.409 4216102.812 Northing (Y) [meters] 3561852.824 254761.637 Easting (X) (meters) 0,42774663 -1.72405501 Convergence [degrees] 1.00001825 1.00034078 Point Scale 1.00000994 1,00033247 Combined Factor US NATIONAL GRID DESIGNATOR: 185TH5476116102(NAD 83) DACE CENTIONS USED

			BAC	L SIA	TTONS DOPD				
PTD	DI	ESIGNATION			LATIT		LONGITUDE		
DH7954	LOY8	LOYOLA 8 COOP	CORS AF	P			W0772709.468		
		CORBIN CORS A					W0772224.571		
DL2310	LOYO	LOYOLA O CORS	ARP		N380300	.626	W0772051.173	39304.8	
		NEAREST	NGS PUBI	ISHED	CONTROL POI		see and the second s	0007 5	
DF6890		BOGGS AZ			N380441	.006	W0774624.011	2821.5	

This position and the above vector components were computed without any knowledge by the

National Geodetic Survey regarding the equipment or field operating procedures used.

FILE: 75812800.DAT 000129895

NGS OPUS SOLUTION REPORT

All computed coordinate accuracies are listed as peak-to-peak values. For additional information: www.ngs.noaa.gov/OPUS/Using OPUS.html#accuracy DATE: October 16, 2009 USER: dclark@mckimcreed.com TIME: 12:05:09 UTC RINEX FILE: 7581280m.090 SOFTWARE: page5 0909.08 master50.pl 081023 START: 2009/10/07 12:57:00 STOP: 2009/10/07 15:08:00 EPHEMERIS: igr15523.eph [rapid] OBS USED: 5367 / 5484 : 98% NAV FILE: brdc2800.09n : 90% 30 # FIXED AMB: 27 / NONE ANT NAME: TRM41249.00 OVERALL RMS: 0.012 (m) ARP HEIGHT: 2 ITRF00 (EPOCH: 2009, 7660) REF FRAME: NAD 83(CORS96) (EPOCH: 2002.0000) 0.040(m)0.040(m)1063035,507(m) 1063036.240(m) X: -4914752.219(m) 0.100(m)0.100(m)-4914753.674(m) Y : 0.015(m) 0.015(m) 3910675.961(m) 3910676.085(m) 2.1 0.051(m)38 3 34,11947 38 3 34,09110 0.051(m)LAT: 0.060(m) 282 12 17,17868 E LON: 282 12 17.19545 0.060 (m) 0.060(m) 77 47 42,82132 0.060(m)W LON: 77 47 42.80455 51,554 (m) 0.074(m)0.074 (m) EL HGT: 52.872(m) 0.090(m) [NAVD88 (Computed using GEOID03)] ORTHO HGT: 85.199(m) STATE PLANE COORDINATES UTM COORDINATES SPC (4502 VA S) UTM (Zone 18) 1191797.422 4216102.826 Northing (Y) [meters] 3561852.788 254761,600 Easting (X) [meters] -1.72405527 0.42774638 Convergence [degrees] 1,00001825 1.00034078 Point Scale 1,00000996 1,00033248 Combined Factor

US NATIONAL GRID DESIGNATOR: 18STH5476116102 (NAD 83)

BASE STATIONS USED

AJ2122	DESIGNATION LOY8 LOYOLA 8 COOP CORS ARP CORB CORBIN CORS ARP LOYO LOYOLA O CORS ARP	N381658.691 N381207.828	LONGITUDE W0772709.468 W0772224.571 W0772051.173	.38944.9 40226.0
	NEAREST NGS PUBLISHED	CONTROL POINT		

DF6890 BOGGS AZ N380441,006 W0774624.011 2821.5

This position and the above vector components were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.

DCN# NAP296

29 Borings As Drilled Page 7 of 7

Volume 1, Revision 0

FINAL DATA REPORT Revision 0 GEOTECHNICAL EXPLORATION AND TESTING SUPPLEMENT 2 DOMINION POWER NORTH ANNA NUCLEAR POWER STATION NORTH ANNA 3 PROJECT MINERAL, LOUISA COUNTY, VIRGINIA

December 16, 2009

VOLUME 1

APPENDIX B Geotechnical Field Data

Prepared By:

MACTEC ENGINEERING AND CONSULTING, INC. RALEIGH, NORTH CAROLINA

MACTEC PROJECT No. 6468-09-2473

Prepared For:

Bechtel Power Corporation Subcontractor No. 25161-500-HC4-CY00-00001

FINAL DATA REPORT Revision 0 GEOTECHNICAL EXPLORATION AND TESTING SUPPLEMENT 2 DOMINION POWER NORTH ANNA NUCLEAR POWER STATION NORTH ANNA 3 PROJECT MINERAL, LOUISA COUNTY, VIRGINIA

December 16, 2009

VOLUME 1

APPENDIX B.1 Geotechnical Boring Logs

Prepared By:

MACTEC ENGINEERING AND CONSULTING, INC. RALEIGH, NORTH CAROLINA

MACTEC PROJECT No. 6468-09-2473

Prepared For:

Bechtel Power Corporation Subcontractor No. 25161-500-HC4-CY00-00001

			TUCLASSIT	ICATION AND SYM	BOLS		
				SOILS			
	Soils classified	under the Unifie	d Soil Classificatio	n System (USCS) and in a	accordance with ASTM	D 2488-08	
CORRELATION OF S	PT RESISTANCE WITH	RELATIVE DENSIT	Y-CONSISTENCY	MOISTURE CONTENT	MODIFIERS		
GRANULAR	MATERIAL	SILTS A	ND CLAYS	DRY-Absence of moisture	Approximate %	Modifiers	
RELATIVE DENSITY	SPT N Value (blows/ft)	CONSISTENCY	SPT N Value (blows/ft)	MOIST-Damp/no visible H2O	<5%	TRACE	
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	WET-Visible free water	5 to 10%	FEW	
LOOSE	5 - 10	SOFT	3 - 4	1	15 to 25%	LITTLE	
MEDIUM DENSE	11 - 30	MEDIUM - STIFF	5 - 8	HCI Reaction	30 to 45%	SOME	
DENSE	31 - 50	STIFF	9 - 15	NONE - No visible reaction	50 to 100%	MOSTLY	
VERY DENSE	> 50	VERY STIFF	16 - 30	WEAK - Some reaction/slow	[1] S. S. Martin, C. C. S. S. Martin, "And South South Strength Strengt Strength Strength	ate of the percentages of gravel, sand, an	
		HARD	>30	STRONG - Violent reaction	a second s	ticles) or other material such as organics, nineral components, etc.	
COLOR of Soil/Rock: see Munsell Soil Color Charts				SPT Sample Numbering: SS-1, SS-2, SS-3, etc.			
Particle Size Range for Sand: Fine, Medium, Coarse				Tested Rock Sample Numbering: RS-1, RS-2, etc.			
Particle Size Range fo		and the second second		Example Soil Description: Silty SAND (SM), light gray (10Y7/1), medium dense, wet, fine to coarse sand, little mica, relict rock fabric			
CITES A COMPLEX CONTRACT			and fant Vertical				
Measurements: Horizontal measurements are rounded to nearest foot. Vertical measurements, such as SPT sample recovery or penetration, sample depths, core run depth, core run length, core recovery, core RQD, etc. are rounded to nearest tenth of a foot (0.1 ft).				Coordinate System and Datum Reference Information: Horizontal - Virginia State Plane Coordinate System, South Zone, NAD 83 (CORS96)(EPOCH 2002); Elevation - NAVD88 (Geoid03)			
V Boreho	le fluid level at time	of drilling comple	tion	Borehole fluid level 24 hours after drilling completion			
Doreno	ie nuie iever at time	on anning complete		in the second	e nate te et al. neute an	a anning tomprotein	
				ROCK			
	CONTRACTOR DURING THE	C. N. C. C. C. C. C. C.	one includes a				
quartz gneiss and bio		ition commonly on the second states of the second s	described as	weathered, moderately clo	ose fracturing, moderately	hard to hard, BIOTITE QUARTZ	
quartz gneiss and bio schist and/or pegmati	of granitic compositite gneiss (or a com	ition commonly on abination of these countered.	described as e); locally zones of I	weathered, moderately clo GNEISS with trace magne	ose fracturing, moderately etite (2 Joints at 45°, tigh	hard to hard, BIOTITE QUARTZ	
quartz gneiss and bio schist and/or pegmati	of granitic composi tite gneiss (or a com tic zones may be en	ition commonly in abination of these countered. TON seolored or stained; ; some fragments of	described as e); locally zones of I	weathered, moderately clo GNEISS with trace magne 60°, open with clay)	ose fracturing, moderately etite (2 Joints at 45°, tigh	A hard to hard, BIOTITE QUARTZ t with trace orange staining; 2 joints RDNESS DESCRIPTION	
quartz gneiss and bio schist and/or pegmati WEATHI	of granitic compositite gneiss (or a com tic zones may be en ERING DESCRIPT Rock except quartz di severe loss in strength	ition commonly of abination of these countered. TON secolored or stained; ; some fragments of k remain secolored or stained; lay alteration; thud	described as e); locally zones of FRACTI	weathered, moderately clo GNEISS with trace magne 60°, open with clay) JRE SPACING	ose fracturing, moderately etite (2 Joints at 45°, tigh ROCK HAF	whard to hard, BIOTITE QUARTZ t with trace orange staining; 2 joints DNESS DESCRIPTION Can be carved with knife; pieces >1" ca be broken by finger pressure; crumbles easily	
quartz gneiss and bio schist and/or pegmati WEATHI SEVERE MODERATELY	of granitic compositite gneiss (or a compositite gneiss (or a compositie zones may be en ERING DESCRIPT Rock except quartz disevere loss in strength strong rock Rock except quartz di erystals dull, show ch	ition commonly of abination of these countered. TON secolored or stained; ; some fragments of k remain secolored or stained; lay alteration; thud ck by hammer ow discoloration and stals dull; dull sound	described as e); locally zones of FRACTU VERY CLOSE	weathered, moderately clo GNEISS with trace magne 60°, open with clay) JRE SPACING < 0.15 ft (2")	ose fracturing, moderately etite (2 Joints at 45°, tigh ROCK HAF VERY SOFT	t with trace orange staining; 2 joints RDNESS DESCRIPTION Can be carved with knife; pieces >1" ca be broken by finger pressure; crumbles easily Can be gouged/grooved with knife; sma	
quartz gneiss and bio schist and/or pegmati WEATHI SEVERE MODERATELY SEVERE	of granitic compositite gneiss (or a compositite gneiss (or a compositie zones may be energy and the second when structure sound when structure second when structure second second when structure second sec	ition commonly of abination of these countered. TON secolored or stained; ; some fragments of k remain secolored or stained; lay alteration; thud ck by hammer ow discoloration and stals dull; dull sound her blows sh; joints stained; ds into rock, may	described as e); locally zones of FRACTU VERY CLOSE CLOSE MODERATELY	weathered, moderately clo GNEISS with trace magne 60°, open with clay) JRE SPACING < 0.15 ft (2") 0.15 ft (2") to 1 foot	ose fracturing, moderately etite (2 Joints at 45°, tigh ROCK HAH VERY SOFT SOFT	 hard to hard, BIOTITE QUARTZ t with trace orange staining; 2 joints Can be carved with knife; pieces >1" ca be broken by finger pressure; crumbles easily Can be gouged/grooved with knife; sina thin pieces broken by finger pressure Can be gouged/grooved by knife with fin 	
quartz gneiss and bio schist and/or pegmati WEATHI SEVERE MODERATELY SEVERE MODERATE	of granitic compositite gneiss (or a compositite gneiss (or a compositie zones may be energy and the severe loss in strength strong rock except quartz di severe loss in strength strong rock except quartz di crystals dull, show el sound when strue Significant portions show eathering effects; cryuunder hamn Rock generally frest discoloration extended to the strength of the strength	ition commonly of abination of these countered. TON scolored or stained; ; some fragments of k remain scolored or stained; lay alteration; thud ek by hammer ow discoloration and stals dull; dull sound her blows sh; joints stained; ds into rock, may he crystals dull joints stained, may ngs; crystals bright;	described as e); locally zones of FRACTU VERY CLOSE CLOSE MODERATELY CLOSE WIDE	weathered, moderately clo GNEISS with trace magne 60°, open with clay) JRE SPACING < 0.15 ft (2") 0.15 ft (2") to 1 foot 1 to 3 feet	ose fracturing, moderately etite (2 Joints at 45°, tigh ROCK HAI VERY SOFT SOFT MEDIUM HARD MODERATELY	 hard to hard, BIOTITE QUARTZ t with trace orange staining; 2 joints Can be carved with knife; pieces >1" ca be broken by finger pressure; crumbles easily Can be gouged/grooved with knife; sma thin pieces broken by finger pressure Can be gouged/grooved by knife with fin pressure; easily broken by hammer Can be scratched by knife or steel pick 	
auartz gneiss and bio schist and/or pegmati WEATHI SEVERE MODERATELY SEVERE MODERATE SLIGHT	of granitic compositite gneiss (or a compositite gneiss (or a compositite gneiss) (or a compositive gneiss) (or a composit	ition commonly of bination of these countered. TON scolored or stained; ; some fragments of k remain scolored or stained; lay alteration; thud ek by hammer ow discoloration and stals dull; dull sound her blows sh; joints stained; ds into rock, may he crystals dull joints stained, may negs; crystals bright; hammer blows right, few joints may , rock rings under	described as e); locally zones of FRACTU VERY CLOSE CLOSE MODERATELY CLOSE	weathered, moderately clo GNEISS with trace magne 60°, open with clay) JRE SPACING < 0.15 ft (2") 0.15 ft (2") to 1 foot 1 to 3 feet >3 feet Tight-Core pieces fit tightly together; no gaps Open-Core pieces fit loosely together; has	ose fracturing, moderately etite (2 Joints at 45°, tigh ROCK HAH VERY SOFT SOFT MEDIUM HARD MODERATELY HARD	 hard to hard, BIOTITE QUARTZ t with trace orange staining; 2 joints Can be carved with knife; pieces >1" ca be broken by finger pressure; crumbles easily Can be gouged/grooved with knife; sma thin pieces broken by finger pressure Can be gouged/grooved by knife with fin pressure; easily broken by hammer Can be scratched by knife or steel pick moderate hammer blows to break samp Rock core rings when struck with a hammer; Can be scratched by knife or st 	
puartz gneiss and bio schist and/or pegmati WEATHI SEVERE MODERATELY SEVERE MODERATE SLIGHT VERY SLIGHT	of granitic compositite gneiss (or a compositite gneiss (or a compositite gneiss) (or a compositive gneiss) (or a composit	ition commonly of bination of these countered. TON scolored or stained; ; some fragments of k remain scolored or stained; lay alteration; thud ek by hammer ow discoloration and stals dull; dull sound her blows sh; joints stained; ds into rock, may he crystals dull joints stained, may negs; crystals bright; hammer blows right, few joints may , rock rings under	described as e); locally zones of FRACTU VERY CLOSE CLOSE MODERATELY CLOSE WIDE JOINT	weathered, moderately clo GNEISS with trace magne 60°, open with clay) JRE SPACING < 0.15 ft (2") 0.15 ft (2") to 1 foot 1 to 3 feet >3 feet Tight -Core pieces fit tightly together; no gaps Open -Core pieces fit loosely together; has gaps	ose fracturing, moderately etite (2 Joints at 45°, tigh ROCK HAH VERY SOFT SOFT MEDIUM HARD MODERATELY HARD HARD	 hard to hard, BIOTITE QUARTZ t with trace orange staining; 2 joints Can be carved with knife; pieces >1" cr be broken by finger pressure; crumble easily Can be gouged/grooved with knife; sma thin pieces broken by finger pressure Can be gouged/grooved by knife with fin pressure; easily broken by hammer Can be scratched by knife or steel pick moderate hammer blows to break samp Rock core rings when struck with a hammer; Can be scratched by knife or steel pick only with difficulty Rock core rings when struck with a hammer; Cannot be scratched by knife 	
puartz gneiss and bio schist and/or pegmati WEATHH SEVERE MODERATELY SEVERE MODERATE SLIGHT VERY SLIGHT FRESH	of granitic compositite gneiss (or a compositite gneiss (or a compositite gneiss) (or a compositive gneiss) (or a composit	ition commonly of bination of these countered. TON scolored or stained; ; some fragments of k remain scolored or stained; lay alteration; thud ck by hammer ow discoloration and stals dull; dull sound ner blows sh; joints stained; ds into rock, may ne crystals dull joints stained, may ngs; crystals bright; hammer blows right, few joints may , rock rings under blows	described as e); locally zones of FRACTU VERY CLOSE CLOSE MODERATELY CLOSE WIDE JOINT DESCRIPTION	weathered, moderately clo GNEISS with trace magne 60°, open with clay) JRE SPACING < 0.15 ft (2") 0.15 ft (2") to 1 foot 1 to 3 feet >3 feet Tight -Core pieces fit tightly together; no gaps Open -Core pieces fit loosely together; has gaps	ose fracturing, moderately etite (2 Joints at 45°, tigh ROCK HAH VERY SOFT SOFT MEDIUM HARD MODERATELY HARD HARD VERY HARD NATION	 c hard to hard, BIOTITE QUARTZ t with trace orange staining; 2 joints c an be carved with knife; pieces >1" or be broken by finger pressure; crumble easily c an be gouged/grooved with knife; sma thin pieces broken by finger pressure c an be gouged/grooved by knife with fin pressure; easily broken by hammer c an be gouged/grooved by knife or steel pick moderate hammer blows to break samp Rock core rings when struck with a hammer; Can be scratched by knife or steel pick only with difficulty Rock core rings when struck with a hammer; Cannot be scratched by knife 	
puartz gneiss and bio schist and/or pegmati WEATHI SEVERE MODERATELY SEVERE MODERATE SLIGHT VERY SLIGHT FRESH Core Terms-A	of granitic compositite gneiss (or a compositite gneiss (or a compositite gneiss) (or a compositive gneiss) (or a composit	ition commonly of abination of these countered. TON scolored or stained; , some fragments of k remain scolored or stained; lay alteration; thud ck by hammer ow discoloration and stals dull; dull sound ner blows sh; joints stained; ds into rock, may ne crystals dull joints stained, may ne crystals bright; hammer blows right, few joints may , rock rings under blows Time in minutes	described as e); locally zones of FRACTU VERY CLOSE CLOSE MODERATELY CLOSE WIDE JOINT DESCRIPTION	weathered, moderately clo GNEISS with trace magne 60°, open with clay) JRE SPACING < 0.15 ft (2") 0.15 ft (2") to 1 foot 1 to 3 feet >3 feet Tight-Core pieces fit tightly together; no gaps Open-Core pieces fit loosely together; has gaps EXPLA	ose fracturing, moderately etite (2 Joints at 45°, tigh ROCK HAH VERY SOFT SOFT MEDIUM HARD MODERATELY HARD HARD VERY HARD NATION I foot of a core run. (1:32	 c hard to hard, BIOTITE QUARTZ t with trace orange staining; 2 joints c t with trace orange staining; 2 joints c an be carved with knife; pieces >1" c be broken by finger pressure; crumble easily c an be gouged/grooved with knife; smathin pieces broken by finger pressure c an be gouged/grooved by knife with fin pressure; easily broken by hammer c an be scratched by knife or steel piel moderate hammer blows to break samp Rock core rings when struck with a hammer; Can be scratched by knife or st pick only with difficulty Rock core rings when struck with a hammer; Cannot be scratched by knife steel pick ; 0:54/0.7 ft) 	
Auartz gneiss and bio schist and/or pegmati WEATHI SEVERE MODERATELY SEVERE MODERATE SLIGHT VERY SLIGHT FRESH Core Terms-A DRILL	of granitic compositite gneiss (or a compositite gneiss (or a compositite gneiss) (or a compositie gneiss) (or a compositie gneiss) (or a compositie gneiss) (or a compositie gneiss) (or a compositient gneiss) (ition commonly of bination of these countered. TON scolored or stained; some fragments of k remain scolored or stained; lay alteration; thud ck by hammer ow discoloration and stals dull; dull sound her blows sh; joints stained; ds into rock, may he crystals dull joints stained, may necrystals dull joints stained, may necrystals bright; hammer blows right, few joints may , rock rings under blows Time in minutes Cored Interval; T	tescribed as e); locally zones of FRACTU VERY CLOSE CLOSE MODERATELY CLOSE WIDE JOINT DESCRIPTION it takes to core one 1 otal distance of core	weathered, moderately clo GNEISS with trace magne 60°, open with clay) JRE SPACING < 0.15 ft (2") 0.15 ft (2") to 1 foot 1 to 3 feet >3 feet Tight-Core pieces fit tightly together; no gaps Open-Core pieces fit loosely together; has gaps EXPLAN foot, for each foot or partia e run measured to nearest 0	see fracturing, moderately etite (2 Joints at 45°, tigh ROCK HAH VERY SOFT SOFT MEDIUM HARD MODERATELY HARD HARD VERY HARD NATION I foot of a core run. (1:32	 c hard to hard, BIOTITE QUARTZ t with trace orange staining; 2 joints c t with trace orange staining; 2 joints c an be carved with knife; pieces >1" c be broken by finger pressure; crumble easily c an be gouged/grooved with knife; sm thin pieces broken by finger pressure; c an be gouged/grooved by knife with fipressure; easily broken by hammer c an be scratched by knife or steel pick moderate hammer blows to break samp Rock core rings when struck with a hammer; Can be scratched by knife or s pick only with difficulty Rock core rings when struck with a hammer; Cannot be scratched by knife c i 0:54/0.7 ft) 	

Legend-NORTH ANNA 3, Rev 0

SOIL AND ROCK SYMBOLS AND DESCRIPTIONS

		NIC	SYME	BOLS	TYPICAL
	MAJOR DIVISIO	5/103	GRAPH	LETTER	DESCRIPTIONS
			SSS	WR	WEATHERED ROCK
	ROCK			HR-WR	HARD ROCK - WEATHERED ROCK
				HR	HARD ROCK
	GRAVEL AND	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	GRAVELLY SOILS	(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
COARSE GRAINED SOILS	MORE THAN 50% OF COARSE	GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
	FRACTION RETAINED ON NO. 4 SIEVE	(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS	SAND AND	CLEAN SANDS		sw	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
LARGER THAN NO. 200 SIEVE SIZE	SANDY SOILS	(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE	SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES
	FRACTION PASSING ON NO. 4 SIEVE	(APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
				ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
30123				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE				мн	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		сн	INORGANIC CLAYS OF HIGH PLASTICITY
				он	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
н	GHLY ORGANIC	SOILS		PT	MUCK, PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS



Prepared By JJJ Date 12/16/05 Checked By MPM Date 12/16/07

BECHT	EL PRC	JECT N	NO.: 25	161		MACTEC PR	OJECT NO .:	6468	-09-2473	C	OUNTY	: L	ouisa, V	A GE	OLOGIST:	A. Mwembes	shi	
SITE DE	ESCRIP	TION: N	North A	Anna 3 F	roje	ct Supplement	2			D	RILLEF	R: R.	Lander	os/D. Rene	au	FLUID L	EVEL (ft)	
	G NO.:					DRILL METH		tary/F	Rock Co	e D	RILL M	ACH	HINE: CM	ME-550X (A	TL)	0 HR.	NA	
GROUN	D ELEN	V.: 314	4.1 ft	(NAV	D88)	NORTHING:	3,909,611	US	ft (NAD	33) E	ASTING	G: 1	11,685,4	84 US	6 ft (NAD83)	24 HR.	48.0	
TOTAL	DEPTH	: 151.	1ft S	SAMPLE	MET	THODS: ASTM	D 1586-08a;	2488	-09a; 21	3-08;	6032-0	08	RODT	PE: AWJ	HAMMER	(ID):140-Ib. A	Auto (MEG	C-0
DATE S	TARTE	D: 9/1	6/09	COM	PLET	ED: 9/18/09	HOLE DIA.	: 3"	CASIN	G DEF	PTH: 43	3.2 ft	CORE	SIZE: NQ	BITS US	ED: 2-7/8" Tr	i-Cone	
ELEV.	DEPTH	BLO	ow co	UNT	-	BLOW	S PER FOOT			SAMP.	V/	L	1	sol	AND POCK	DESCRIPTION		
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20 40	60	80	100	NO.	MOI			SUL	AND ROCK L	ESCRIPTION		
314.1					1.	Grou	ind Surface											
514.1	-		-			GIOU	ing Sunace			-		YIC	314.1		(Roadway) to			
1					10	******	******	* * *	***			1	312.1	1		COURSE to 2 9.5 feet due to		
-	-				1.1	* * * * * * * *		* * *	1.1.1				-			nion Personne		
-	-					******	******		1.1.1				5					
304.6	9.5				1.1	*******							-304.6					-
-	-	2	3	3	1	6	******	* * *	1 1 1	SS-1			-	RESIDUAL	SOIL: Silty S	SAND (SM), ye ist, fine grained	llowish	
302.3 +	- 11.8	3	4	3		7				SS-2				trace of mic	a, relict rock	fabric		
299.7	_ 14.4	-								SS-3			-	medium gra	ained sand	10YR 6/6), fine		
1	-	3	4	4	1.1	•8				50-5	- 1		-	14.4 ft: Ligh mica	nt brownish gr	ay (10YR 6/2),	few	
295.9	18.2		4	-						SS-4			F	19.2 8 Dal	brown (10VI	R 6/8), fine to c	00000	
-	-	3	4	4	12	•8		2.1.4	1	0.04			F		nd, trace mica		Jaise	
	-				1.			***	* * * * * *				-					
290.9	23.2	4	4	6		10		111		SS-5			-	23.2 ft: Ver	y pale brown	(10YR 7/3), littl	e mica	
1					1.1	1	******						-					
285.9	28.2				12.4		******						-					
1	-	12	16	20	1.4			* * *	***	SS-6	-		F		yish brown (1 nd, trace mica	0YR 5/2), dens	se, fine	
1						******												
280.9	33.2	35	46	50/0.4	11				~	S5-7	-		-	33.2 ft: Liak	nt brownish gr	ay (10YR 6/2).	verv	
-	-	1000		122210					50/8.4	-			-	dense				
275.9	38.2				1 1			/.					F					
-	-	16	25	36	1.4	* * * * * * *			4.44	SS-8	1		F	38.2 ft: Few	mica			
1	-					*******		1				5	273.1	WEATHER	ED ROCK: S	everely weather	ered	_ 4
270.9	43.2	50/0 1			1 10				1	SS-9		5	270.0	BIOTITE Q	UARTZ GNE	ISS (No Recov	very)	4
-	-	50/0.1			-) -(*******	*****		50/0.1	00-0	1		-	HARD ROO	CK: Light gray	brown, brown	ish	
1							******				V		È.	clinhtly was	thered very	oderately seve		
-	-					*******	*****	* * *			-	>>>	1	BIOTITE Q	UARTZ GNE	to moderately ISS	hard,	
-	-				1.1			111					t					
1							******					\gg	Ł					
-													-					
-	-							* * *					t					
-	-						*****						- 255.6		CK: Croute li	ght gray, with p	ink and	-
-	-								1 - 1			\gg	F	brown, slig	htly weathered	d to fresh, very	close	
-	-											\otimes	F	QUARTZ C	SNEISS	o very hard, BI	OIIIE	
-	-												F					
-					16				1.1.8				1					
-	-				1.1		*****											
-	-						* * * * * * *		* * *									
-													+					
		1	F		1.00							1111						





BECHT	EL PRO	JECT N	10.: 25	5161		MACTEC PR	OJECT NO .:	6468	-09-2473	0	COUNTY	1: L	ouisa, VA GE	OLOGIST: A	A. Mwembe	shi
					Projec	t Supplement	2			1	ORILLER	R: R.	Landeros/D. Rene	au	FLUID L	EVEL (ft)
	G NO.:			0.000		1	OD: Mud Rol	ary/F	Rock Co	re E	RILL M	ACH	INE: CME-550X (A	TL)	0 HR.	NA
	DELEV		.1 ft	(NAV	D88)	NORTHING:						_		S ft (NAD83)		48.0
	DEPTH		-			HODS: ASTM				-		-	ROD TYPE: AWJ	HAMMER (
	TARTE	_		-		ED: 9/18/09	HOLE DIA .:	_	-		and the second second	-	CORE SIZE: NG		D: 2-7/8" T	
	DEPTH		DW CO		1		S PER FOOT	-	1	SAMF	10000	L	1.0	12 martine		
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20 4		80	100	NO.	1/	0 G	SOIL	AND ROCK D	ESCRIPTION	1
					1			-								
					•						1		in the second second			
239.3	-		-	-	1	Continued 1	rom previous	page			-	000	HARD RO	CK: Gray to ligh	nt oray, with a	oink and
													brown, slig to wide fra QUARTZ (129.0 ft: Li 133.5 ft: Li	oss of drill fluid oss of drill fluid omplete loss of der of boring	circulation to circulation to	132.5 ft 136.8 ft





BECHT	TEL PRO	DJECT I	NO.: 25	5161		MACTEC PR	OJECT NO .:	6468	-09-2473	C	OUNT	': L	ouisa, VA GEOLOGIST: A. Mwembeshi
					rojec	t Supplement	2			D	RILLER	R: R.	Landeros/D. Reneau FLUID LEVEL (ft)
	G NO .:				-	1	IOD: Mud Rol	tary/	Rock Cor	D	RILL M	ACH	HINE: CME-550X (ATL) 0 HR. NA
		V.: 31	4.1 ft	(NAV	D88)	NORTHING:						_	11,685,484 US ft (NAD83) 24 HR. 48.0
		1: 151.				HODS: ASTM				-		-	ROD TYPE: AWJ HAMMER (ID):140-Ib. Auto (MEC
		ED: 9/1		-		ED: 9/18/09	HOLE DIA .:			_			t CORE SIZE: NQ3 BITS USED: 2-7/8" Tri-Cone
1.0.0	DEPTH	-	ow cc	-	1		S PER FOOT	-		AMP		L	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20 40	60	80		NO.	MOI	O G	SOIL AND ROCK DESCRIPTION
						- 1 - 1				-			
						S. M. Lawrence La							
64.5	-	-	-	-		Continued f	rom previous	page	B	-	-	111	
-	-	-	-	-	-		i ti mai			-		011	163.0 Boring and coring terminated at 151.1 feet.
-	+												Boring closed by tremie method with
	F												cement-bentonite grout.
	Ţ												24 hour water level measured on 9/18/2009
4													 prior to drilling. Borehole was at a depth of 136.8 feet.
	t												
	ŧ												
-	F												-
2	ŧ												
	t												
1	t												-
	Ŧ												-
	‡												
5	ŧ												-
	ł												1
	Ţ												
-	ŧ												-
	ŧ												-
	t												-
-	Ŧ												-
3	ŧ										1		2
-	t		1										-
	÷												2
	Ŧ											1	E.
-	‡												-
	t												1
-	÷												-
-	‡										1		2
	t												1
	+												-
1	‡												-
	‡												-
	t												
-	+												
	‡												
	t											1	
	Ŧ												-
	ŧ												-
													t
-	Ŧ												F
	Ţ												-
	+												ŧ.
1	T												<u>-</u>



SHEET 1 OF 2

BECHT	EL PRO	JECT	NO.: 2516	51	N	ACTEC	PROJ	ECT N	0.: 6	468-09-2473	COUNTY: Louisa, VA	GEOLOGIST: A.	Mwembeshi
SITE D	ESCRIP	TION:	North An	na 3 Pr	oject S	Supplem	ent 2				DRILLER: R. Landeros/D	Reneau	FLUID LEVEL (ff
BORIN	G NO.:	M-1			D	RILL ME	THOD	: Mud	Rota	ry/Rock Core	DRILL MACHINE: CME-5	50X (ATL)	OHR. NA
GROUN	ND ELEV	. 3	14.1 ft	(NAVE	088) N	ORTHIN	G: 3,	909,61	11	US ft (NAD83)	EASTING: 11,685,484	US ft (NAD83)	24 HR. 48.
TOTAL	DEPTH	151	1 ft			200 2 2 CA.M.			_	3a: 2488-09a: 2'	113-08; 6032-08	HAMMER (ID): 1	140-lb. Auto (MEC-05
	STARTE		1.000			D: 9/18/	1			EPTH: 43.2 ft	CORE BARREL TYPE: W	ireline NQ3 Triple T	ube, series 6 & 8 bits
DATE	STARTE	u. a	10/03	COM		D. 5110	00	UNUIN	0.01		Conc Brittle The T	nomine trade trapies to	
			DRILL	R	JN	in the second second	STR	ATA	111				
ELEV. (ft)	DEPTH (ft)	RUN (ft)	RATE	REC. (ft)	RQD	SAMP. NO.	REC. (ft)	RQD (ft)	0		DESCRIPTION	N AND REMARKS	
(is)	1.4	1.9	(Min/ft)	%	(fl) %	(A ST	%	%	G				
					_					Land-		ring @ 43.2 ft	CONTRACTOR OF THE
270.9	43.2	5.0	N=50/0.1 0:43	(4.1) 82%	(4.1) 82%	RUN 1	(0.0)	(0.0)	R		HERED ROCK: Severely wear ery) (continued)	thered BIOTITE QUAR	TZ GNEISS (No
			2:17 2:01				(10.0)	(7.8)	$\langle \rangle \rangle$	HARD	ROCK: Light gray brown, brow		
265.9	48,2	0.0	1:57 2:15	10.0	(0.0)	DUMP	69%	54%		- modera	ly to slightly weathered, very c ately hard, BIOTITE QUARTZ	GNEISS	medium hard to
265.6	48.5	0.3	0:49/0.3	(0.2) 67%	(0.0) 0%	RUN 2 RUN 3			2//	- (1 joint Quarts	at 75°, open with brown staini	ng)	
		1.1	0:49	(1.9) 38%	(0.4) 8%					(Quartz			
260.6	53.5	5.0	2:04 2:02			RUN 4	1			- /d inint	at 30°, open with black staining	a: 2 joints at 45° onen	with prance
		5.0	1:19 2:27	(3.8) 76%	(3.3) 66%	NON 4				- (1 joint staining		al a jointe ar no " oben	mai erange
			1:09 2:03			1.00							
255.6	58.5 59.5	1.0	3:01 6:25	(1.0)	(1.0)	RUN 5	(91.7)	(85.6)	M	- 255.6 	ROCK: Gray to light gray, with	pink and brown, slight	ly weathered to
		4.0	1:25 1:38	100%	100%	RUN 6	99%	92%		- fresh, v GNEIS	very close to wide fracturing, h	ard to very hard, BIOTI	TE QUARTZ
250.0	63.5		1:33 2:38	(4.0) 100%	90%					- (2 joint	s at 30°, open with black stain	ing; 1 joint at 45°, open	; 1 joint at 75°,
250.6	03,5	5.0	2:27	(4.5)	(4.1)	RUN 7			VII	open) (2 joint	s at 0-10°, open with orange s	taining: 3 joints at 30°,	open with orange
	1.2.11		1:38 2:00	90%	82%					staining	g)		
245.6	68.5		2:47 3:08				2						
		5.0	2:15 2:16	(5.0)	(4.4) 88%	RUN 8				- (3 joint stainin	s at 45°, open with orange sta	ining; 3 joints at 75°, op	en with orange
			2:24 2:13	100%	00 %					-	5/		
240.6	73.5	-	2:20	1000	10.01	Dillio -					-1 450		
		5.0	3:16 2:50	(5.0) 100%	(5.0) 100%	RUN 9				- (1 Joint	at 45°, open with orange stair	(g)	
			2;39 2;45		100				VII				
235.6	78.5	5.0	2:50	(5.0)	(5.0)	RUN 10			All	- (No joi	nts)		
			3:30 5:41	100%	100%	10201-031			111				
230.6	00.0		5:44 6:20										
230,6	83.5	5.0	1:35	(4.8)	(4.5)	RUN 11					at 30°, open with trace mica;	1 joint at 45°, open with	trace brown
			2:46 3:39	96%	90%					- stainin	g)		
225.6	88.5		4:36 5:22	1		-				-			
		5.0	8:17 6:13	(5.0) 100%	(4.5) 90%	RUN 12			2		at 0-10°, ope with orange stai ange staining)	ning: 5 joints at 45°, op	en with trace mica
		1.11	2:20	10076	50 /6					E C	ange otoning)		
220.6	93.5		3:16	10.01	15.00	DUMAS			111	-	at dee anna shi anna b	atalalast	
		5.0	8:01 5:55	(5.0) 100%	(5.0) 100%	RUN 13				(1 joint	at 45°, open with trace brown	staining)	
			5:35 5:04										
215.6	98,5	5.0	5:10 7:16	(5.0)	(5.0)	RUN 14				(1 ioin	at 45°, open with orange stair	nina)	
		0.0	8:24 3:05	100%	100%					E	and the state of the state of the state		
-	100.5	_	2:58						2	-			
210.6	103.5	5.0	3:24	(4.0)	(4.5)	RUN 15	1				ts at 15°, open with trace oran	ge staining; 2 joints at 4	5°, open with
			2:11 2:21	80%	90%				VII	orange	e staining)		
205.6	108.5		4:20 3:55	-									
200.0	100.0	5.0	5:14 4:49	(4.8)	(3.8)	RUN 16	1				t at 15°, open with brown and I	black staining; 4 joints a	at 45°, open with
			3:47	96%	76%					orange	e-brown staining)		
200.6	113.5		2:41 1:59							F		in and a second second	
		5.0	2:40 3:04	(5.0)	(4.3) 86%	RUN 17					t at 0-10°, open with trace orar and black staining)	nge staining; 9 joints at	45°, open with trace
			3;13 3:31	10070	10000				K	F	Com and the state of the		

MACTEC

SHEET 2 OF 2

BECHT	EL PRO	JEGI	NO.: 251	01		ACTEC	PRUJ	EGIN	0., 0	+00-03-2415	COUNTY: Louisa, VA	GEOLOGIST. A.	Mwembeshi	-
SITE DI	SCRIP	TION:	North An	ina 3 Pi	roject	Supplem	ent 2				DRILLER: R. Landeros/D.	Reneau	FLUID LE	VEL (ft)
BORING	S NO.:	M-1			E	RILL ME	THOD	: Mud	Rota	ry/Rock Core	DRILL MACHINE: CME-55	OX (ATL)	0 HR.	NA
ROUN	D ELEV	.: 3	814.1 ft	(NAVI	N (880	ORTHIN	G: 3	,909,61	1	US ft (NAD83)	EASTING: 11,685,484	US ft (NAD83)	24 HR.	48.0
TOTAL	DEPTH:	151.	1 ft	SAM	PLE M	ETHODS	AST	M D 15	86-08	3a; 2488-09a; 2	113-08; 6032-08	HAMMER (ID): 1	40-lb. Auto (N	AEC-05)
DATE S	TARTE	D: 9/	16/09	COM	PLETE	D: 9/18/	09	CASIN	IG DE	EPTH: 43.2 ft	CORE BARREL TYPE: WI	reline NQ3 Triple Tu	ube, series 6 &	& 8 bits
ELEV.	DEPTH	RUN	DRILL	REC.	JN RQD	SAMP.	STF REC.	RQD	LO		DESCRIPTION	AND REMARKS		
(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	G		DESCRIPTION	AND REWARKS		
			1000		*		1				Continued from	m previous page		
195.6/	118.5/	5.0	3:36	(5.0)	(4,7)	RUN 18	-	-	00	HARD	ROCK: Gray to light gray, with	pink and brown, slight	y weathered to	
		0.0	3:00 3:03	100%	94%	NON 10					very close to wide fracturing, has S (continued)	ard to very hard, BIOTIN	E QUARTZ	
100.0	100 5		2:57 3:04 1:28	1121						(1 joint	at 30°, open with orange stain g; 1 joint at 75°, open with oran	ing; 2 joints at 45°, ope oe-brown staining; 0.1	n with orange ft thick quart vei	in
190.6	123.5	5.0	3:30	(5.0)	(5.0)	RUN 19				_ at 119.	5 ft and 0.8 ft thick quartz vein at 75", open with orange stain	at 122.5 ft)	a prise quart voi	
			5:10 5:50	100%	100%					(1)0/01	at 10 , open with orange stain			
185.6	128.5	-	4:20 3:36											
		5.0	3:15 3:44	(5.0) 100%	(4.5) 90%	RUN 20				stainin	s at 0-10°, open with orange st g; 1 joint at 90°, open with oran	ge and black staining)	open with orange	8
			3:19 5:19		2.0					129.0 f	t; Loss of drill fluid circulation to	o 132.5 ft		
180.6	133.5	3.3	4:22 5:51	(3.3)	(3.3)	RUN 21					t: Loss of drill fluid circulation to			
1770	100.0	0.0	6:36 4:32	100%	100%	Scarse Pro					at 45°, open with trace orange		om 136.2-136.8	(1)
177.3	136.8	0.7	0:56/0.3	(0.7)	(0.7)	RUN 22				(No joli		mulation for monthly	of having	
175.6	138.5	1.0	2:45	(1.0)	100%	RUN 23 RUN 24				(No joi			and a state of the	
		5.0	3:48 3:23	100%	100%						s at 40-50°, open with orange s vein at 140.0 feet)	taining; 1 joint at 75°, ti	ght; 0.1 ft thick	
170,6	143.5		3:98 3:17	100%	100%	EL IL LOS							OF REED	
		5.0	4:12 4:37	(5.0)	(4.2) 84%	RUN 25				- (7 joint	s at 50-60°, open with orange s	staining; 4 joints at 60-5	iur, tight)	
			4:25 5:26	10010	C / IC									
165.6	148.5	2.6	5:36 8:30	(2.6)	(2.6)	RUN 26			\gg	- (1 joint	at 45°, open with orange stain	ing; 2 joints at 75-90°, 1	ight to open with	'n
163.0	151.1		7:32 7:01/0.6	100%	100%		_			103.0	staining)	fa al		15
											and coring terminated at 151.1			
										Boring	closed by tremie method with	cement-bentonite grout		
						8					r water level measured on 9/18 of 136.8 feet.	3/2009 prior to drilling.	Borehole was a	ta
						8				-				
						1				5				
										-				
						5				5				
										-				
										E .				
										-				
										2				
										-				
										ť.				
										20				
									3					
									118	-0				
										-				

North Anna 3 Project MACTEC Project No. 6468-09-2473



M-1 - Box 1



M-1 - Box 2



M-1 - Box 3



M-1 - Box 4

North Anna 3 Project MACTEC Project No. 6468-09-2473



M-1 - Box 5

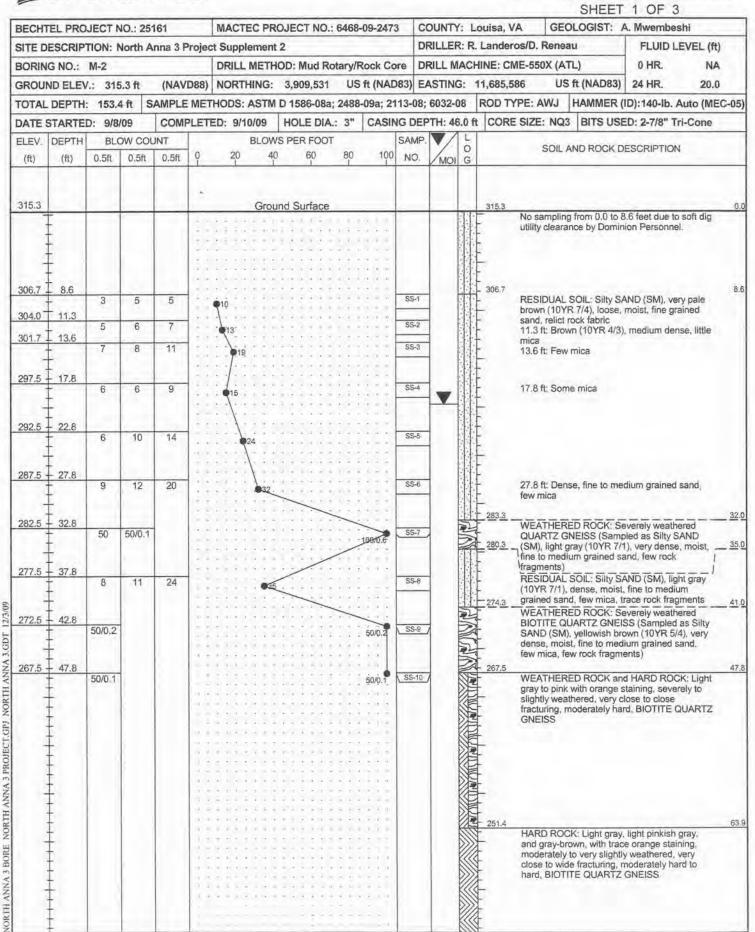


M-1 - Box 6



Prepared By JJJ Date 12/16/09

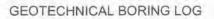
Checked By MAL Date 12/16/09





allowers a state

BECH	TEL PRO	DJECT N	10.: 2	5161		MACTEC	PRO	JECT NO .:	6468-	09-2473	0	COUNT	1: L	ouisa, VA GEO	LOGIST: A	A. Mwembe	shi
SITE D	ESCRIP	TION: N	North	Anna 3 I	Proje	ct Supplem	nent 2				E	RILLER	R: R.	Landeros/D. Renea	u	FLUID L	EVEL (ft)
BORIN	IG NO .:	M-2	-			DRILL MI	ETHO	D: Mud Ro	tary/R	lock Co	re [RILL	ACH	INE: CME-550X (AT	Ľ)	0 HR.	NA
ROU	ND ELE	V.: 315	5.3 ft	(NAV	(D88)	NORTHIN	IG: :	3,909,531	US	ft (NAD	83) E	ASTIN	G: 1	11,685,586 US	ft (NAD83)	24 HR.	20.0
	DEPTH		-			THODS: AS					-			ROD TYPE: AWJ			Auto (MEC-
	STARTE				_	ED: 9/10/0		OLE DIA.						CORE SIZE: NQ3	-	D: 2-7/8" T	
	DEPTH			OUNT	The	-		PER FOOT	_		SAMP	1	L	CONL OILL. HO	5110 000		11-00110
(ft)	(ft)	0.5ft	0.5f	1	0	20	40	60	80	100	NO.	1/	0	SOIL A	ND ROCK D	ESCRIPTION	N
(11)	(11)	0.011	0.01	0.01	1	1	1		1	1.	110.	MOI	G				
240.5			_			Continue	ed from	m previous	page		_						
	ţ													HARD ROC and grav-bro	K: Light gray, wn, with trace	light pinkish e orange stai	gray, ning,
	t				· * *	* * * * *	* * *	*****	* * *	10 m 11 11 m 11				moderately t	o very slightly	weathered,	very
	+				11		***	11111	* * *	· · ·				hard, BIOTI	e fracturing, m TE QUARTZ (GNEISS (cor	ntinued)
1	Ŧ					* * * * *	* * *			a. + 30				-			
	t									1.4.4							
	t						* * *		* * *	* * * *				F			
-	Ţ				12 9				* * *					-			
	t						***	* * * * *	* * *								
	ŧ				* *	*****			* * *	* * *				F			
	Ŧ							*****						F			
-	t									4 + 4							
	t						* * *	* * * * *		1 + 0				-			
	Ŧ													F			
	t				* *			* * * * *	* * *								
	Ŧ		<u> </u>		-		* * *	* * * * *						-			
	‡									÷				-			
	t																
	+						***		111					-			
	Ŧ		6			·	+ + +							F			
	t		8		+ +									E			
	Ŧ							11111						-			
1	‡				1.41.4									-			
	+						***		111	1				t			
	Ŧ						***		• • •					£ .			
1	ŧ																
	t						* * *	*****	111								
	Ŧ									· · ·				-			
1	t																
	+				1		1.1.1	* * * * *						ł			
	Ŧ						***			e x +				-			
	t				0.4					100				t l			
	+									111				-			
	Ţ																
1	t				1 4 4		* * *	*****	* * *	***							
	f		5		1				4 ÷ 4	* * *				ł			
	‡				1			1	- 3 9	+ + *				Į.			
	t				1			11111									
	Ŧ									1.4.4				ł			
	t				1				* * *	* * *				t.			
	t				33		* * *	*****	* * *	1.1.2				-			
	Ţ				1.4.1				* * *					Ţ			
	t						* * *	*****		111				t			
	+				1		* * *	* * * * *						-			
	Ţ				× -		4			-				E .			
	4	1			1.4		7 - 5						XIII	1			





BECHT	TEL PRO	OJECT	NO.: 2	5161		MACTEC PR	OJECT NO .:	6468	-09-2473	CO	UNTY	: L	ouisa, VA	GEOLOGIST: A	A. Mwembes	shi
SITE D	ESCRIP	TION:	North	Anna 3	Proje	ct Supplement	t 2			DR	ILLEF	R: R.	Landeros/D.	Reneau	FLUID L	EVEL (ft)
BORIN	G NO.:	M-2				DRILL METH	OD: Mud Ro	otary/F	Rock Core	DR	ILL M	ACH	HINE: CME-55	0X (ATL)	0 HR.	NA
ROU	ND ELE	V.: 31	5.3 ft	(NA)	/D88)	NORTHING:	3,909,531	US	ft (NAD83) EA	STINC	G: 1	11,685,586	US ft (NAD83)	24 HR.	20.0
OTAL	DEPTH	1: 153.	4 ft	SAMPL	EME	THODS: ASTM	D 1586-08a	; 2488	-09a; 2113	-08; 6	6032-0	08	ROD TYPE: A	WJ HAMMER (ID):140-lb. /	Auto (MEC-
ATE	STARTE	ED: 9/8	/09	COM	PLET	ED: 9/10/09	HOLE DIA	.: 3"	CASING	DEPT	TH: 46	5.0 ft	t CORE SIZE	: NQ3 BITS USE	D: 2-7/8" T	ri-Cone
LEV.	DEPTH	BL	ow co	DUNT		BLOV	S PER FOOT	Ē	SA	MP.		LO		SOIL AND ROCK D	ESCOIDTION	
(ft)	(ft)	0.5ft	0.5f	t 0.5ft	0	20 4	0 60	80	100 M	10.	MOI			SOIL AND NOON D	LOUNPHON	•
			1													
165.7						Continued f	from previous	s page								
-	+	1		1		* * * * * * * *	* * * * * * *					111	-			
	Ŧ				1								161,9			15
-	F		1	-										g and coring termina	ited at 151.1 f	
-	ŧ													g closed by tremie m	nethod with	
	‡												-	ent-bentonite grout.		12101
2	ŧ.												- prior	our water level measi to drilling. Borehole		
	+												- 83.4		Craterio	
	t															
1	t												-			
	ł				1								2			
	F												-			
1	Ŧ		1								0.1		-			
	ŧ												-			
-	‡												-			
	‡.												-			
	t												-			
-	ŧ												-			
													2			
	t												E			
	÷		r										-			
	F												-			
-	Ŧ										1		F			
	‡		1								8		F			
1	‡												-			
-	t									1			-			
	ŧ		K - 1									13	-			
	t												-			
	Ŧ												-			
	Ŧ		1										-			
	Ŧ												-			
	Ŧ												F			
	‡												-			
3	±												F			
	t												-			
	F												-			
													-			
	‡															
	1												-			
	+												-			
	Ţ									_			-			



BECHT	EL PRO	JECT	NO.: 251	61	N	ACTEC	PROJ	ECT N	0.: 64	-09-2473 COUNTY: Lot	uisa, VA	GEOLOGIST: A.	Mwembeshi	
SITE D	ESCRIP	TION:	North An	na 3 Pr	oject S	Supplem	ent 2			DRILLER: R. L	anderos/D.	Reneau	FLUID LEV	EL (ft
BORIN	G NO.:	M-2			D	RILL ME	THOD	: Mud	Rota	Rock Core DRILL MACHI	NE: CME-55	OX (ATL)	0 HR.	NA
GROUN	ND ELEV	. 3	315.3 ft	(NAVI	088) N	ORTHIN	G: 3	909,53	31	ft (NAD83) EASTING: 11,	685,586	US ft (NAD83)	24 HR.	20.
TOTAL	DEPTH	153	.4 ft	SAM	PLE MI	ETHODS	AST	N D 15	86-08	2488-09a; 2113-08; 6032-08	3	HAMMER (ID): 1	40-lb. Auto (M	EC-05
	STARTE		Y 10 10	1		D: 9/10/	T				10000000	eline NQ3 Triple Ti		
	UTACIE		0,00							An artistic and a series where we have		and the state of the state		* 14/14
		-	DRILL		JN	0.00		RATA	LI					
ELEV. (ft)	DEPTH (ft)	RUN (ft)	RATE (Min/ft)	REC. (ft)	RQD (ft)	SAMP. NO.	REC:	RQD (ft)	G	D	ESCRIPTION	AND REMARKS		
		-	liourory	20	70		70	70			Sec. 340	- B 2 2		_
-			NG POINT	170.01	20.01	DUNIA	17.01	24 -95	-	WEATHERED BOCK at		ng @ 47.8 ft		
267.5	47.8	0.6	N=50/0.1 1:32/0.6	(0.6)	(0.0)	RUN 1 RUN 2	(7.2) 45%	(1.7) 11%		WEATHERED ROCK and staining, severely to slight				
		0.0	1:20 4:00	(1.5)	(0.7)		0.00			moderately hard, BIOTIT (2 joints at 45°, open with	E QUARTZ G	INEISS	h orange staining	0
261.9	53.4		2:10 2:25	30%	14%	1			R	(2 joints at 40 , open with	In trace ciay, 2	joints at 70 . Open with	in ordinger stairing	1
		5.0	3:02	(2.7) 54%	(1.0) 20%	RUN 3				(6 joints at 45°, open with with orange staining)	h orange stain	ing and trace clay; 3 jo	pints at 75°, open	
1.21			2:22 2:00 0:53	0-470	2070					min orange stanning)				
256.9	58.4		2:32	10.00	10.01	DOM: N				(Day 11-1-1-1-		hand an in the second	an applications	
121		5.0	3:40 5:40	(2.4) 48%	(0.0) 0%	RUN 4			唐	(Several joints/fractures,	severely weat	inered, open with orar	ige staining)	
1.1	1		2:35 3:05						家					
251,9	63.4	5.0	4:00 2:00	(4.5)	(4.1)	RUN 5		-	A	1.4				_
		0.0	3:05	90%	82%	1.0110	(88.4) 99%	(76.0) 85%		HARD ROCK: Light gray staining, moderately to v				a
-			2:15 2:00				100			moderately hard to hard,	BIOTITE QU	ARTZ GNEISS	and view of a	
246.9	68.4	3.5	2:02	(3.3)	(1.2)	RUN 6				(6 joints at 45°, light with	orange staini	na)		
			2:04 2:14	94%	34%					(5 joints at 45°, open wit RUN 7)).5 ft of RUN 6 wi	lh
243.4		1.5	1:34/0.5	(1.5)	(1.2)	RUN 7				(3 joints at 30°, open wit	h trace orange	staining)		
241.9	73.4	5.0	2:00/0.5 2:45	100%	80%	RUN 8				(3 joints at 75% open wit				
11			1:53 2:30	(5.0)	(4.7) 94%									
236.9	78.4		1:50 2:50 2:22											
200.0	70.4	5.0	1:18	(5.0)	(3,9)	RUN 9			VIA	(2 joints at 45°, open wit	h clay; 2 joints	at 90°, open with clay	1)	
	1		1:42 2:03	100%	78%									
231,9	83,4		2:05 2:21			1.00				at more and				
		5.0	3:30 3:14	(4.7) 94%	(4.7) 94%	RUN 10				(3 joints at 45°, tight with clay)	n trace orange	staining; 1 joint at 75°	, open with trace	
			2:59 3:20	0.170	0 110									
226.9	88.4	F.0.	3:37	15.0)	(2.0)	TH IAL 44				14 1-1414 of 459 page 1.4		ince of failed at 759 and	a with stars 0.2.8	
		5.0	3:00 2:59	(5.0)	(2.9) 58%	RUN 11				(4 joints at 45°, open wit thick quartz vein at 92.4		ing, i joint at /5", ope	ni with clay; 0.2 ft	
			2:10 2:47							and the arcenterie				
221.9	93.4	5.0	2:41 2:50	(4.9)	(4.1)	RUN 12				(3 joints at 30°, open wit	h orange stain	ing: 1 joint at 90° one	n with orange	
		-	2:03 2:17	98%	82%				11	staining)	and a state	all designs and take	1	
040.0			2:03											
216.9	98.4	5.0	2:07 4:04	(5.0)	(4.6)	RUN 13	1			(3 joints at 30°, open wit	h orange stain	ting; 1 joint at 75°, ope	n with orange	
			3:43 3:11	100%	92%					staining and clay)				
211,9	103.4		3:28 3:30											
	100.4	5.0	2:45	(5.0)	(4.4)	RUN 14	1			(6 joints at 45°, open wit	h orange stain	ing; 1 joint at 75°, ope	in with orange	
			1:57	100%	88%					staining)				
206.9	108.4		2:03 1:49						VIA	AND CARACTERING				
		5.0	2:25	(5.0)	(4.8) 96%	RUN 15				(3 joints at 30°, open tra staining; 0.1 ft thick qua	ce orange stai rtz vein at 112	ning; 1 joint at 75°, op .4 ft)	en with orange	
			2:47 1:57	1.55.10					11	and an				
201.9	113.4	6.0	2:01	12.02	14.70	DUNISC				(0 interior at 00% and a 10		stalations of factors at 70	0 onon udde terror	
		5.0	2:15 1:30	(4.8) 96%	(4.7) 94%	RUN 16				(3 joints at 30°, open wit orange staining)	in trace orange	staining; 1 joint at 75	, open with trace	1
			1:28 1:35							111 S 111 113				
196.9	118.4	5.0	2:50	(5.0)	(4,7)	RUN 17	-			(2 joints at 0-10°, tight; 1	lioint at 45° o	pen with orange stain	ing: 1 joint at 60°	
		0.0	1;37	100%	94%			1		open with orange stainin		Pair min vienge atem	ar . Jour ar un	

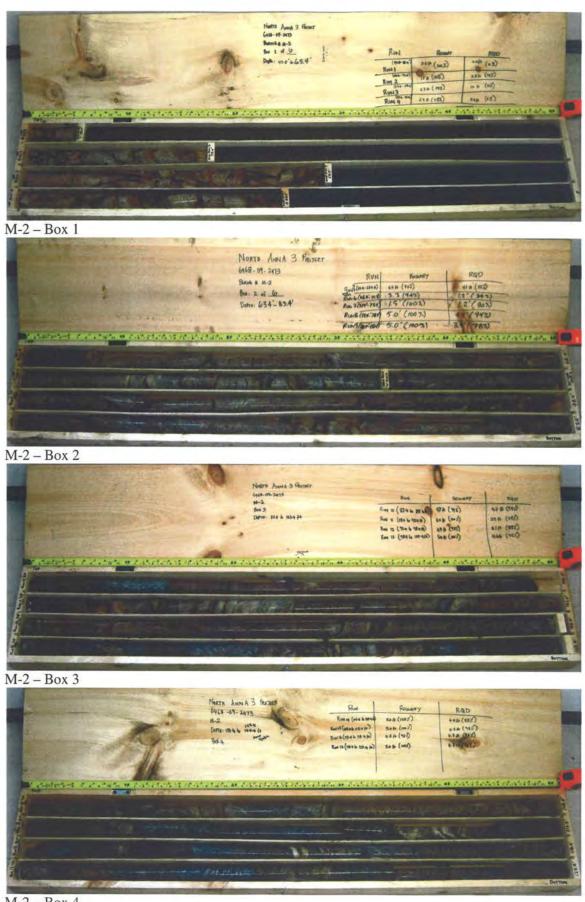


SHEET 2 OF 2

BECHTEL PROJECT NO .: 251	61	MACTEC PR	OJECT NO .:	6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST: A	. Mwembeshi	
SITE DESCRIPTION: North Ar	nna 3 Projec	t Supplement	2		DRILLER: R. Landeros/D	Reneau	FLUID L	EVEL (ft)
BORING NO .: M-2		DRILL METH	OD: Mud Ro	tary/Rock Core	DRILL MACHINE: CME-5	50X (ATL)	0 HR.	NA
GROUND ELEV .: 315.3 ft	(NAVD88)	NORTHING:	3,909,531	US ft (NAD83)	EASTING: 11,685,586	US ft (NAD83)	24 HR.	20.0
TOTAL DEPTH: 153.4 ft	SAMPLE	METHODS: AS	STM D 1586-	08a; 2488-09a; 2	113-08; 6032-08	HAMMER (ID):	140-lb. Auto ((MEC-05)
DATE STARTED: 9/8/09	COMPLET	TED: 9/10/09	CASING	DEPTH: 46.0 ft	CORE BARREL TYPE: W	ireline NQ3 Triple T	ube, series 6	& 8 bits

	DEDTU	DUNI	DRILL	RI	JN	CAND	STR	ATA	L	
(ft)	DEPTH (ft)	RUN (ft)	RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	0 G	DESCRIPTION AND REMARKS
					*					Continued from previous page
191.9	123.4		1:53					-	111	HARD ROCK: Light gray, light pinkish gray, and gray-brown, with trace orange
		5.0	1:01 1:15 1:23	(4.9) 98%	(4.8) 96%	RUN 18				staining, moderately to very slightly weathered, very close to wide fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS (continued)
186.9	128.4		2:03 1:38			-				(2 joints at 30°, open with orange staining; 2 joints at 60°. tight)
100.9	120.4	5.0	1:25	(4.8)	(4.4)	RUN 19	1			(2 joints at 30°, open with trace orange staining; 2 joints at 60°, open with
			1;44 1:53	96%	88%					orange staining)
181.9	133.4		1:48		_					
101.3	100.4	5.0	3:19 2:11	(5.0)	(3.4)	RUN 20	1		\gg	(3 joints at 30°, open with orange staining; 10 joints at 45°, open with clay;
		-	2:44	100%	68%	1				 Moderately severely weathered, medium hard, BIOTITE GNEISS from 134.9-138.4 ft)
176.9	138.4		2:46 2:30							
		5.0	2:38 1:48	(5.0)	(4.5) 90%	RUN 21	1			 (Several joints at 45°, open with clay; 1 joint at 75°, open with orange staining and clay; moderately severely weathered, medium hard, BIOTITE GNEISS from
			1:50	100 /0	30 /0					138.4-138.8 feet and from 142.4-143.4 feet)
171.9	143.4		1:44			-				
		5.0	2:24 2:02	(5.0)	(4.1) 82%	RUN 22				(5 joints at 45°, open with clay; 3 joints at 75°, open with orange staining; moderately severely weathered, medium hard, BIOTITE GNEISS from
			3:02 2:20	100.10	S. I.V.					143.4-146.4 feet)
166.9	148.4	EA	2:03	I IE ON	14.01	RUN 23				(2 juicts at 45% account the base alout
		5.0	3:03	(5.0)	(4.8) 96%	NON 25				(2 joints at 45°, open with trace clay)
			3:28 3:49							
161.9	153.4		4:15	-	-		-			L Boring and coring terminated at 151.1 feet.
										Boring closed by tremie method with cement-bentonite grout.
										 24 hour water level measured on 9/10/2009 prior to drilling. Borehole was at a depth of 83.4 feet.
					1.1					
										É.
										2
										-
_			-	121	1					

North Anna 3 Project MACTEC Project No. 6468-09-2473



M-2 - Box 4

North Anna 3 Project MACTEC Project No. 6468-09-2473



M-2 - Box 5

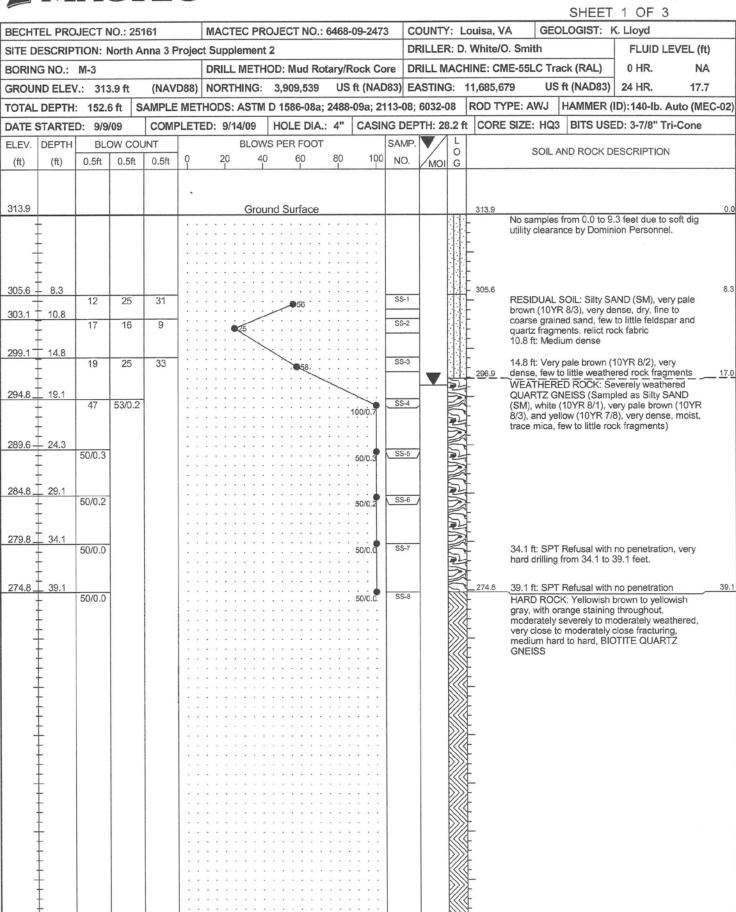
	North Anna 3 PROJECT 6469-09-2473 M-2 Box6 Darry 1954 to 1934 8	Rust Rusz (new-trift) Rusz 35 (new-trift)	Recovery See (and) See (and)	<u>KOD</u> 410 (827) 9494(482)	-
					2
e produkter i se en	erkente est net autor son derekteringen bester bester	a Antonio de Carlos	elestada M d		11.04.00
e producto de la contra de Castras					ET GAL M

M-2 - Box 6



Prepared By JJJ Date 12/16/09

Checked By MAL Date 12/16/09



12/16/09

NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT

NORTH ANNA 3 BORE



SHEET 2 OF 3

DEOU	TEL DOC	IFOT	10.0	E464		0.0.0	CTEC P	PO 1	ECT NO	6469	00 247	2		v. 1	ouisa, VA	GE	DLOGIST: 1	2 OF 3	<i>.</i>	
	TEL PRO				Deci				ECT NO.:	0408	09-247				. White/O. Smit			1		41
	DESCRIPT		North	Anna 3	Proje					e !=							ook (DAL)	{	LEVEL (f	
	IG NO.:								: Mud Ro						HINE: CME-55L			0 HR.	N/	
	ND ELEV					·			,909,539						11,685,679		ft (NAD83)	24 HR.	17.	
OTAL	_ DEPTH:	152.	6 ft	SAMPL	E ME	THO	DS: AST	MD	1586-08a;	2488	-				ROD TYPE: A	_	HAMMER (EC
DATE	STARTED	0: 9/9	/09	CON	PLE	TED:	9/14/09	H	IOLE DIA.	: 4"	CASI	IG DE	PTH: 20	8.2 f	t CORE SIZE:	HQ	BITS USE	ED: 3-7/8" T	ri-Cone	
ELEV.		BL	OW C						PER FOOT			SAMP	P. 🗸			SOIL	AND ROCK D	ESCRIPTIO	N	
(ft)	(ft)	0.5ft	0.5f	t 0.5ft	0 1		20 4	40 1	60	80	100	NO.	MOI	G						
239.1					1	C	ontinued	from	n previous	nade										
239.1					+ ·			iion	ii pievioue	page				<i></i>	238.2					
	ŦI													\otimes			K: Dark gray- severely to me			
_	‡				1										close	to mo	derately close lerately hard, l	fracturing, m	nedium	
	± I							• •))))		0 1100	eratery nard, l	BIOTTE GN	2100	
	F													\blacksquare			K: Light gray			
_	‡		1		1			::						\gg	slight	y wea	thered, close t ard, QUARTZ	to moderately		
	±							• •		• • •				\leq	£ nactu	nig, I	aru, worki z	. ONLIGO		
	Ŧ									· · ·				\gg	}					
	‡				1										\$					
	+							• •							223.3					
	Ŧ									· · ·							K: Yellowish I light gray, with			
	±							• •							slight	y to v	ery slightly we	athered, mod	derately	
	+														L Close BIOTI	TE Q	underate	ely nard to ha	aro,	
	‡				1										F					
	t														上					
	F														1					
	‡							: :							Ŧ					
	+							•							Ł					
	Ŧ														}					
	‡				1		 	: :							₹					
	+							• •							}					
-	Ŧ						· · · · ·	: :							F					
	±													\otimes	2 201 2					
	Ŧ													\mathbb{K}			K: Yellowish			
-	±						 	: :						\gg	gray,	with o	range staining	, moderately	severe	
	+							• •						K	fractu	ring, r	noderately ha			
	Ŧ		1					: :						\gg			NEISS			
-	±				1:									K	£⊤					
	+		1		1.									\gg	}					
	‡		1					· ·						\leq	£					
-	±													\gg	1					
	Ŧ													\leq	\$					
	‡		1				· · · ·	: :						\gg	4					
	+							• •							£					
	I I				1									$\langle \rangle \rangle$	1					
	±						* * * *	· ·							\$					
	+													$\langle \rangle \rangle$	-					
	‡														£					
	±				:									$\langle \rangle \rangle$						
-	+ 1							с. н К. н							}_					
	‡				:									1	i l					
	+ 1														171.3					
	Ŧ						• • • • • • • • • •) RO(na. sli	CK: Yellowish ghtly weathere	brown with o	ely close	
	±		1		:										fractu	iring, I	nard, BIOTITE	QUARTZ G	NEISS	
	+				1.										*					
	± I		1		1:			× × × ×							在					



SHEET 3 OF 3

BECHT	TEL PRO	JECT	NO.: :	25161		MACTEC PR	OJECT NO .:	6468-	09-2473	CO	UNTY	: L	ouisa, VA GEOLOGIST:	K. Lloyd	
					3 Proj	ect Supplemen				DR	LLER	: D.	White/O. Smith	1	EVEL (ft)
-	G NO.:			3.4965		1	OD: Mud Ro	tarv/F	Rock Core	DR	LLM	ACH	INE: CME-55LC Track (RAL)	0 HR.	NA
	ND ELEV		3.9 ft	(N	AVD88) NORTHING:		-		-		-	1,685,679 US ft (NAD83	-	17.7
-	DEPTH					THODS: ASTN						-		(ID):140-lb.	
	STARTE		_			TED: 9/14/09	HOLE DIA.	_	-		_	-		ED: 3-7/8" T	
	DEPTH			OUNT			VS PER FOOT	_		MP.	•/	L		LDIG IIC II	in wone
(ft)	(ft)	0.5ft	0.5	- 1	oft 0	20 4		80		NO.	MOI	0 G	SOIL AND ROCK	DESCRIPTION	1
()		0.010			1			-1		Ť	IVIOI	-			
64.3			-	-	-	Continued	from previous	page)) () () () () () () () () ()	_		111			
					-		******					\gg	- 161.3		1
				1						-		220	Boring and coring termin	nated at 152.6	
													Boring closed by tremie	method with	
	Ē											ł	cement-bentonite grout.		
-	-											F	24 hour water level mea prior to drilling. Borehold		
	-												117.6 feet.	- net or a dop	
1	Ŧ														
1	ŧ I														
	t I											t			
-	Ł														
	E		1										-		
-	F											F			
1	‡														
	‡		Ľ –												
													5		
1													-		
	F														
	ŧ.												1		
	ŧ I												5		
1	t														
1	t I														
	t														
	Ŧ			1									-		
-	Ŧ												-		
	‡														
	‡												E I		
-	t												-		
	t												-		
	Ŧ												p.		
1	‡												-		
1	‡														
	t												-		
	+														
	Ţ														
1	Ţ.														
	t														
2	‡												-		
	t														
	t														
	I												-		



SHEET 1 OF 2

BECHTEL PROJECT NO .: 2516	1	MACTEC PRO	JECT NO .:	6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST: H	<. Lloyd	
SITE DESCRIPTION: North Ann	a 3 Projec	t Supplement 2			DRILLER: D. White/O. Smit	h	FLUID L	EVEL (ft)
BORING NO.: M-3		DRILL METHO	D: Mud Rot	ary/Rock Core	DRILL MACHINE: CME-55L	C Track (RAL)	0 HR.	NA
GROUND ELEV.: 313.9 ft	(NAVD88)	NORTHING:	3,909,539	US ft (NAD83)	EASTING: 11,685,679	US ft (NAD83)	24 HR.	17.7
TOTAL DEPTH: 152.6 ft	SAMPLE	METHODS: AST	TM D 1586-0)8a; 2488-09a; 2	113-08; 6032-08	HAMMER (ID):	140-lb. Auto	(MEC-02)
DATE STARTED: 9/9/09	COMPLE	TED: 9/14/09	CASING [DEPTH: 28.2 ft	CORE BARREL TYPE: Wire	eline HQ3 Triple	Tube, series 6	& 10 bits

			DRILL	RL	JN	0.4140	STR	ATA	L		
ELEV. (ft)	DEPTH (ft)	RUN (ft)	RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	O G	DESCRIPTION AND REMARKS	
					`					Begin Coring @ 39.1 ft	
274.8 271.3	39.1 42.6	3.5	N=50/0.0 2:59 4:17 4:40	(3.3) 94%	(2.0) 57%	RUN 1	(34.2) 93%	(23.9) 65%		 274.8 HARD ROCK: Yellowish brown to yellowish gray, with orange staining throughout, moderately severely to moderately weathered, very close to moderately close fracturing, medium hard to hard, BIOTITE QUARTZ GNEISS 	39.1
		5.0	1:12/0.5 3:55 3:55 3:17 5:18	(5.0) 100%	(3.4) 68%	RUN 2				 (3 joints at 40°, tight; 2 joints at 70°, tight to open with trace clay) (6 joints at 40°, tight; 1 joint at 80-90°, open with clay and orange staining) 	
266.3	47.6	5.0	3:18 4:08 4:54 4:18	(5.0) 100%	(4.8) 96%	RUN 3				(5 joints at 50-60°, tight)	
261.3	52.6	5.0	3:45 3:39 2:32 2:02	(3.6) 72%	(2.1) 42%	RUN 4				- - - - (5 joints at 30°, tight; severely weathered zone with partial recovery from 54.7-56.4 ft)	
256.3	57.6	5.0	1:52 3:27 3:36 5:08			RUN 5					
		5.0	3:32 2:59 2:50	(5.0) 100%	(3.7) 74%	KUN 5				(4 joints at 30°, tight)	
251.3	62.6	5.0	2:20 6:28 8:54 7:48 4:24	(4.8) 96%	(3.0) 60%	RUN 6				(4 joints at 30°, tight to open)	
246.3	67.6	5.0	2:57 7:44 9:34 3:08 4:45	(4.4) 88%	(2.4) 48%	RUN 7				(6 joints at 30°, tight to open)	
241.3	72.6	5.0	3:45 5:00 4:04 9:10	(3.8) 76%	(2.5) 50%	RUN 8				(4 joints at 30°, tight to open)	75.7
236.3	77.6	5.0	10:15 2:51 3:34 3:40 4:40 7:06	(3.0) 60%	(2.2) 44%	RUN 9	(2.7) 46%	(1.2) 20%		HARD ROCK: Dark gray-brown to black, moderately severely to moderately weathered, close to moderately close fracturing, medium hard to moderately hard, BIOTITE GNEISS (3 joints at 30°, tight to open)	81.6
_231.3 _226.3 _221.3 _216.3 _211.3 _206.3 _201.3	82.6	5.0	14:15 3:45 3:01 3:11 3:04	(5.0) 100%	(3.2) 64%	RUN 10	(9.0) 100%	(6.3) 70%		HARD ROCK: Light gray with orange staining, slightly weathered, close to moderately close fracturing, hard, QUARTZ GNEISS (3 joints at 30°, tight; 3 joints at 40-50°, open with trace clay)	01.0
226.3	87.6	5.0	3:04 2:04 3:08 3:38 2:39	(5.0) 100%	(2.6) 52%	RUN 11				(4 joints at 30°, tight) 223.3	90.6
221.3	92.6	5.0	3:45 5:41 4:21 3:37	(5.0) 100%	(3.8) 76%	RUN 12	(22.0) 100%	(16.3) 74%		HARD ROCK: Yellowish brown, yellowish gray, and gray to light gray, with orange staining, slightly to very slightly weathered, moderately close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS (3 joints at 30°, tight; 2 joints at 60-70°, tight with trace clay)	
216.3	97.6	5.0	5:31 4:06 2:50 4:13	(5.0)	(4.0)	RUN 13				(2 joints at 10°, open; 2 joints at 45°, tight)	
211.3	102.6		4:30 4:12 5:55 6:00	100%	80%						
		5.0	3:23 3:11 3:08 3:38	(5.0) 100%	(4.1) 82%	RUN 14				(5 joints at 30-40°, tight)	
206.3	107.6	5.0	3:03 4:55 3:49 3:08	(5.0) 100%	(3.9) 78%	RUN 15				(2 joints at 30°, tight; 1 joint at 60°, tight with trace clay; 1 joint at 75°, open with clay and orange staining)	
201.3	112.6	5.0	3:52 4:32 3:37	(4.8)	(2.3)	RUN 16	(27.2)	(10 /)			112.6
	1	0.0	0.07	(4.0)	(2.0)		(41.4)	(10.4)	1111		

Volume 1, Revision 0

MACTEC

SHEET 2 OF 2

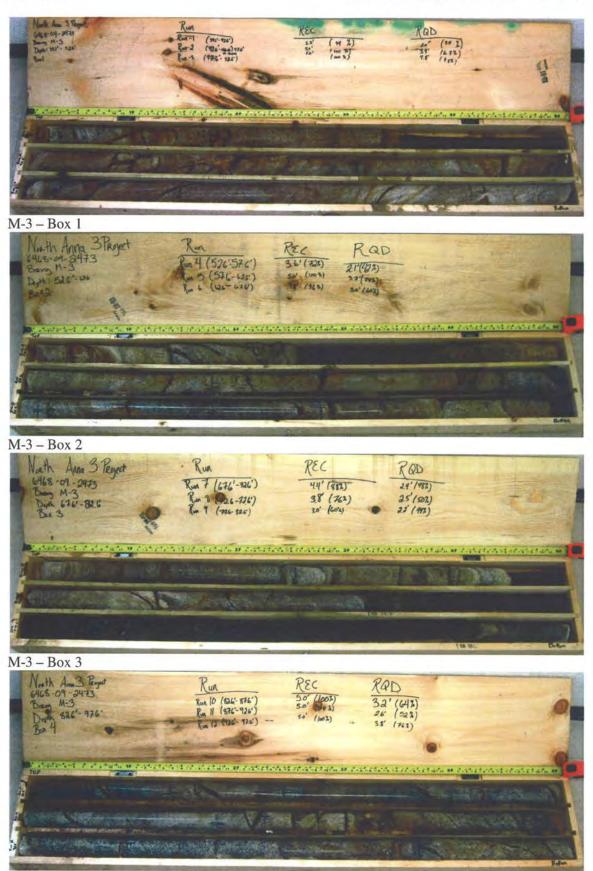
BECHTEL PROJECT NO.: 25161	MACTEC PRO	JECT NO.: 6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST:	K. Lloyd	
SITE DESCRIPTION: North Anna 3	Project Supplement 2	2	DRILLER: D. White/O. Smit	h	FLUID L	EVEL (ft)
BORING NO.: M-3	DRILL METHO	D: Mud Rotary/Rock Core	DRILL MACHINE: CME-55L	C Track (RAL)	0 HR.	NA
GROUND ELEV .: 313.9 ft (NA)	D88) NORTHING:	3,909,539 US ft (NAD83) EASTING: 11,685,679	US ft (NAD83)	24 HR.	17.7
TOTAL DEPTH: 152.6 ft SAM	IPLE METHODS: AS	TM D 1586-08a; 2488-09a; 2	2113-08; 6032-08	HAMMER (ID):	: 140-lb. Auto (MEC-02)
DATE STARTED: 9/9/09 COI	IPLETED: 9/14/09	CASING DEPTH: 28.2 ft	CORE BARREL TYPE: Wire	eline HQ3 Triple	Tube, series 6	& 10 bits

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	STR REC. (ft)	ATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS	
			(((((((((((((((((((((((((((((((((((((((70			70			Continued from previous page	
196.3	117.6		2:58 3:19 5:50 5:23	96%	46%		91%	65%		HARD ROCK: Yellowish brown to yellowish gray, with orange staining, moderately severe to slightly weathered, close to moderately close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS (continued)	
190.3	117.0	5.0	9:23 8:11 9:32 6:14	(2.4) 48%	(2.0) 40%	RUN 17				(3 joints at 30°, tight to open; 1 joint at 80-90°, open with clay; no recovery in severely weathered zone from 117.4-120.2 ft)	
191.3 189.3		2.0	3:45 4:28 3:47	(2.0)	(1.8) 90%	RUN 18	-			(2 joints at 30°, open with trace clay; many mechanical fractures)	
		3.0	4:05 6:05	(3.0)	(2.0) 67%	RUN 19				(3 joints at 10-20°, tight; quartz vein from 125.7-126.1 ft)	
186.3		5.0	4:02 4:17 4:05 4:05 5:24 5:57	(5.0) 100%	(3.9) 78%	RUN 20	-			(2 joints at 15°, tight; 1 joint at 70°, open with trace clay)	
181.3		5.0	5:57 3:24 2:28 2:09 3:03	(5.0) 100%	(4.7) 94%	RUN 21	-			(2 joints at 30°, open)	
176.3		5.0	4:16 3:11 3:30 4:54 4:03 3:28	(5.0) 100%	(2.7) 54%	RUN 22				(8 joints at 10-20°, tight; 1 joint at 30°, tight; 2 joints at 50-60°, open with trace clay)	142
171.3		5.0	4:00 4:32 4:01 4:05 3:50	(5.0) 100%	(4.6) 92%	RUN 23	(10.0) 100%	(9.5) 95%		HARD ROCK: Yellowish brown with orange staining, slightly weathered, moderately close fracturing, hard, BIOTITE QUARTZ GNEISS (4 joints at 30°, tight; 2 joints at 90°, tight)	142
166.3		5.0	3:13 3:25 2:54 3:01	(5.0) 100%	(4.9) 98%	RUN 24				(2 joints at 30°, tight; 1 joint at 50°, open with trace clay; quartz + feldspar vein at 45° from 151.9-152.1 ft)	150
	152.6		3:09							161.3 Boring and coring terminated at 152.6 feet. Boring closed by tremie method with cement-bentonite grout. 24 hour water level measured on 9/14/2009 prior to drilling. Borehole was at a depth of 117.6 feet.	152

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

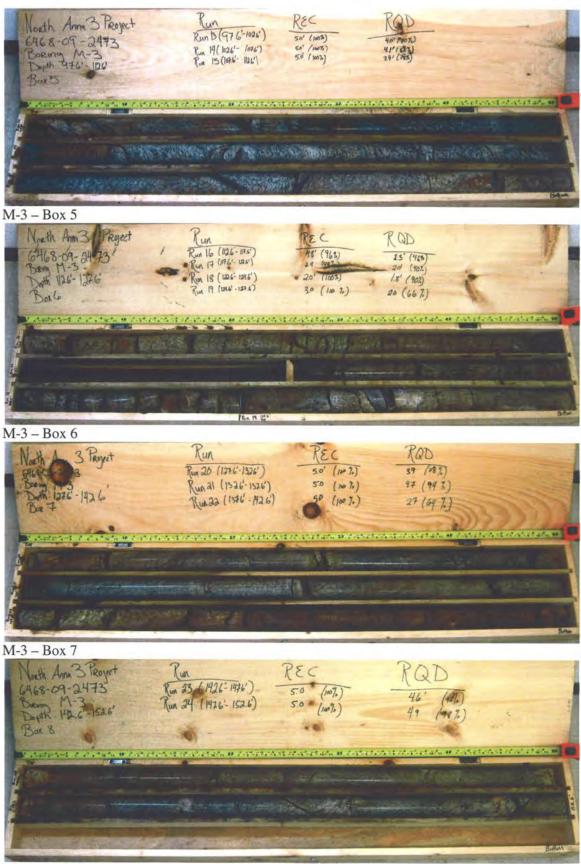
I

North Anna 3 Project MACTEC Project No. 6468-09-2473



M-3 - Box 4

North Anna 3 Project MACTEC Project No. 6468-09-2473

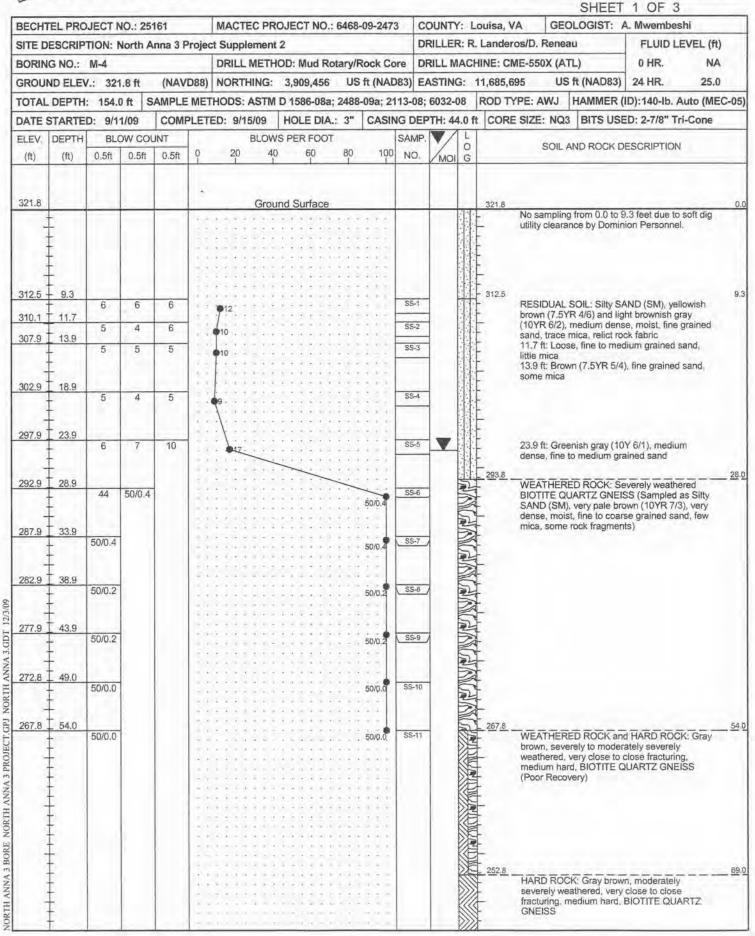


M-3 – Box 8



Prepared By JJJ Date 12/16/05

Checked By MAL Date 12/16/09





SHEET 2 OF 3

BECH	TEL PRO	JECT	IQ : 25	161		MACTEC	PR	OJECT NO .:	6468	-09-247	3 0	OUNT	Y: 1	SHEET 2 OF 3 Louisa, VA GEOLOGIST: A. Mwembeshi
					Irojos				0 100	20 m-11				R. Landeros/D. Reneau FLUID LEVEL (ft)
			North A	anna 3 F	10)90	t Supplem								
	IG NO.:							OD: Mud Ro						CHINE: CME-550X (ATL) 0 HR. NA
GROU	ND ELEV	/.: 32	1.8 ft	(NAV	D88)	NORTHIN	IG:	3,909,456	US	ft (NAE	083) E	ASTIN	G:	11,685,695 US ft (NAD83) 24 HR. 25.0
TOTAL	DEPTH	: 154.	0ft S	AMPLE	MET	HODS: AS	STM	D 1586-08a;	2488	-09a; 21	13-08	; 6032-	80	ROD TYPE: AWJ HAMMER (ID):140-Ib. Auto (MEC-
DATE	STARTE	D: 9/1	1/09	COMP	PLET	ED: 9/15/0	19	HOLE DIA.	: 3"	CASIN	IG DE	PTH: 44	4.0 f	ft CORE SIZE: NQ3 BITS USED: 2-7/8" Tri-Cone
ELEV.	DEPTH	BL	DW COL	JNT		BL	.ow	S PER FOOT			SAMF	2. 💙/	L	SOIL AND ROCK DESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	NO.	MOI		
247.0				ļ	<u>.</u>	Continue	ed fr	rom previous	page				h	
1	+						• •						\otimes	HARD ROCK: Gray brown, moderately severely weathered, very close to close
	+													fracturing, medium hard, BIOTITE QUARTZ GNEISS (continued)
	t				1 : :		11		:::				\otimes	GNEISS (conunded)
	+													
	Ť.				1 : :		: :							237.8
	+					* * * * *	• •	*****		$e \times e$			5	U WEATHERED ROCK: Gray to dark gray,
	Ŧ				1		: :	 	:::				5	severely weathered, very close fracturing, soft,
-	t l				• •		: :						F	BIOTITE QUARTZ GNEISS (Poor Recovery)
	+				1									HARD ROCK: Light to dark gray, moderately to
	Ţ				::		::	 						very slightly weathered, very close to wide
-	t						• •							fracturing, medium hard to hard, BIOTITE GNEISS
	- - -				1		::							
	‡				::		: :							
-	+									1.1.1				*
	‡				1 : :		::	 						
	+						• •		• • •				\otimes	
-	Ŧ				1.1		: :							K -
	t						• •	* * * * * *	••••				\otimes	
	+				1.1									A -
_	‡				11		::	******					\otimes	
	t							* * * * * * *	• • •					
	Ŧ				÷.,								\otimes	ȴ
	t												KK	
	÷												\otimes	*
	‡				100		::							
	+													》と
	Ŧ				1.1									*
	t				8.8									×
	+												K	
	Ŧ						: :						\otimes	»F
	t									• • •				
	Ŧ				1									»»-
7	t						• •	* * * * * * *						
	÷													*
	‡				111		::		1.1.1					
	t						•	*****						» \
	Ŧ													K-
	‡				1 : :		• •							»x
-	+				1.1									—
	Ŧ				1									ȴ
	t				· ·									
-	Ŧ				1.1		: :							»F
	t				1.2									<pre>Kt</pre>
	+				1.0									*
	1				111		× ×							***
	+				1.1									<u>}</u>
	t												V///	





SHEET 3 OF 3

ECHT	EL PRO	JECT	NO.: 25	161		MACTEC PR	OJECT NO .:	6468	-09-2473	CC	DUNT	: Lo	ouisa, VA GEO	LOGIST: A	. Mwembes	hi
ITE D	ESCRIP	TION: I	North A	Anna 3 P	rojec	t Supplement	12			DF	RILLER	R: R.	Landeros/D. Reneau	u	FLUID L	EVEL (ft)
ORIN	G NO.:	M-4				DRILL METH	OD: Mud Ro	tary/F	Rock Core	DF	RILL M	ACH	INE: CME-550X (ATI	L)	0 HR.	NA
ROUN	ND ELEN	1.: 32	1.8 ft	(NAV	D88)	NORTHING:	3,909,456	US	ft (NAD8	3) EA	STIN	G: 1	1,685,695 US	ft (NAD83)	24 HR.	25.0
OTAL	DEPTH	: 154.	0 ft S	SAMPLE	MET	HODS: ASTM	D 1586-08a;	2488	-09a; 211	3-08;	6032-0	08	ROD TYPE: AWJ	HAMMER (I	D):140-lb. A	uto (MEC-
ATE S	TARTE	D: 9/1	1/09	COMP	LET	ED: 9/15/09	HOLE DIA.	: 3"	CASING	DEP	TH: 44	1.0 ft	CORE SIZE: NQ3	BITS USE	D: 2-7/8" Tr	i-Cone
LEV.	DEPTH	BL	ow co	UNT		BLOW	S PER FOOT			AMP.	\mathbf{V}	LO	SOIL AL		ESCRIPTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20 40	0 60	80	100	NO.	MOI		SOLA	NO NOON DI		
72.2		11				Continued f	rom previous	Dage								
1 4.14	_			-	2.1				7.1.0	-						
-	-					* * * * * * * *							Tast			
1	-		-					-		-	-	111	Boring and co	oring termina	ted at 154.0 fe	teet.
-	-												- Boring closed	d by tremie m	ethod with	
1													cement-bento			
	-												24 hour wate prior to drilling			
-	8												119.0 feet.	g. Dorenole	was at a ucpt	10
-	+															
-																
-	-															
1	-															
-	2												-			
1	-															
-	-															
-	-												-			
-	5															
-	-															
-																
4	-				1								-			
-	2															
1	-															
-													-			
1	-		1													
1													1			
-	Ē															
-	-															
-	-												2			
-	-												-			
	Ē															
-	-												1			
	-										1					
-	-															
-	T															
-	F												-			
	-		5													
3	-												1			
		1	1	1	1						1	1 1				
	Ē												2			



SHEET 1 OF 2

BECHTEL PROJECT NO.: 2516	1	MACTEC PRO	JECT NO .: (6468-09-2473	COUNTY:	Louisa, VA	GEOLOGIST:	A. Mwembesh	I
SITE DESCRIPTION: North Ann	na 3 Projec	t Supplement 2	1		DRILLER:	R. Landeros/D. F	Reneau	FLUID L	EVEL (ft)
BORING NO .: M-4		DRILL METHO	D: Mud Rot	ary/Rock Core	DRILL MA	CHINE: CME-550	X (ATL)	0 HR.	NA
GROUND ELEV .: 321.8 ft	(NAVD88)	NORTHING:	3,909,456	US ft (NAD83)	EASTING:	11,685,695	US ft (NAD83)	24 HR.	25.0
TOTAL DEPTH: 154.0 ft	SAMPLE	METHODS: AS	TM D 1586-0)8a; 2488-09a; 2	113-08; 603	2-08	HAMMER (ID):	140-lb. Auto	(MEC-05)
DATE STARTED: 9/11/09	COMPLE	TED: 9/15/09	CASING D	DEPTH: 44.0 ft	CORE BAR	RREL TYPE: Wire	eline NQ3 Triple	Tube, series 6	bit

ELEV.	DEPTH	RUN	DRILL	RL		SAMP.	STR		L	
(ft)	(ft)	(ft)	RATE (Min/ft)	REC. (ft) %	RQD (ft) %	NO.	REC. (ft) %	RQD (ft) %	O G	DESCRIPTION AND REMARKS
					•					Begin Coring @ 44.1 ft
277.7	44.1	4.9	1:59 1:25 1:55 2:11 1:41/0.9	(0.0) 0%	(0.0) 0%	RUN 1	(0.0) 0%	(0.0) 0%		WEATHERED ROCK: Severely weathered BIOTITE QUARTZ GNEISS (Sampled as Silty SAND (SM), very pale brown (10YR 7/3), very dense, moist, fine to coarse grained sand, few mica, some rock fragments) (continued) (No Recovery)
		5.0	N=50/0.0 1:45 1:18 0:57 1:05	(0.0) 0%	(0.0) 0%	RUN 2				(No Recovery)
267.8		5.0	2:00 N=50/0.0 2:45 2:00 2:03 1:29	(0.9) 18%	(0.5) 10%	RUN 3	(2.4) 16%	(1.0) 7%		267.8 WEATHERED ROCK and HARD ROCK: Gray brown, severely to moderately severely weathered, very close to close fracturing, medium hard, BIOTITE QUARTZ GNEISS (Poor Recovery) (2 joints at 45°, open)
262.8	59.0	5.0	1:58 0:50 1:02 1:03 1:54	(1.1) 22%	(0.5) 10%	RUN 4				(2 joints at 45°, open)
257.8	64.0	5.0	1:08 0:49 1:25 0:36 0:54	(0.4) 8%	(0.0) 0%	RUN 5				
252.8	69.0	5.0	0:47 0:51 0:59 0:39 0:40	(3.5) 70%	(2.6) 52%	RUN 6	(11.5) 77%	(10.0) 67%		HARD ROCK: Gray brown, moderately severely weathered, very close to close fracturing, medium hard, BIOTITE QUARTZ GNEISS (2 joints at 45°, open)
247.8	74.0	5.0	0:52 1:34 0:45 1:34 1:38	(3.5) 70%	(3.4) 68%	RUN 7				(3 joints at 45°, open; 1 joint at 75°, open)
242.8	79.0	5.0	1:09 0:30 0:58 0:51 0:50	(4.5) 90%	(4.0) 80%	RUN 8				(3 joints at 45°, open) - 237.8
237.8		5.0	0:54 0:30 1:02 1:10 0:58 1:19	(1.0) 20%	(0.0) 0%	RUN 9	(1.0) 20%	(0.0) 0%		237.8 WEATHERED ROCK: Gray to dark gray, severely weathered, very close fracturing, soft, BIOTITE QUARTZ GNEISS (Poor Recovery)
227.8		5.0	1:48 2:57 2:27 1:13 1:32	(4.9) 98%	(4.6) 92%	RUN 10	(58.6) 90%	(48.0) 74%		HARD ROCK: Light to dark gray, moderately to very slightly weathered, very close to wide fracturing, medium hard to hard, BIOTITE GNEISS (6 joints at 30°, open with trace clay and epidote)
227.8		5.0	1:31 1:35 1:34 2:03 1:34	(4.5) 90%	(2.7) 54%	RUN 11				(4 joints at 30°, open with trace orange staining and epidote)
217.8	00.0	5.0	1:13 1:32 1:19 1:56 2:18	(2.1) 42%	(1.0) 20%	RUN 12				(0.4 ft thick quartz + feldspar vein)
217.8		5.0	1:46 1:44 1:47 1:57 1:56	(4.6) 92%	(4.3) 86%	RUN 13				(3 joints at 45°, open with orange staining)
		5.0	1:25 1:31 1:04 1:43	(4.2) 84%	(2.3) 46%	RUN 14				(1 joint at 75°, open with brown staining; few severely weathered zones)
207.8	114.0	5.0	2:10 2:51 2:04 1:21	(5.0) 100%	(4.3) 86%	RUN 15				(4 joints at 45°, open with trace brown staining; 1 joint at 75°, open with trace brown staining)

Volume 1, Revision 0



SHEET 2 OF 2

DATE STARTED: 9/11/09	COMPLET	TED: 9/15/09	CASING	DEPTH: 44.0 ft	CORE BARREL TYPE: W	ireline NQ3 Triple T	ube, series 6	bit
TOTAL DEPTH: 154.0 ft	SAMPLE	METHODS: AS	STM D 1586-	08a; 2488-09a; 2	113-08; 6032-08	HAMMER (ID):	140-lb. Auto	(MEC-05)
GROUND ELEV .: 321.8 ft	(NAVD88)	NORTHING:	3,909,456	US ft (NAD83)	EASTING: 11,685,695	US ft (NAD83)	24 HR.	25.0
BORING NO .: M-4		DRILL METHO	OD: Mud Rot	tary/Rock Core	DRILL MACHINE: CME-5	50X (ATL)	0 HR.	NA
SITE DESCRIPTION: North Ar	na 3 Projec	t Supplement	2		DRILLER: R. Landeros/D	. Reneau	FLUID L	EVEL (ft)
BECHTEL PROJECT NO .: 251	61	MACTEC PRO	DJECT NO .:	6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST: A	. Mwembeshi	1

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RQD (ft) %	LOG	DESCRIPTION AND REMARKS
					•					Continued from previous page
407.0	101.0	5.0	2:22 1:32 1:23 1:34 1:22	(5.0) 100%	(4.6) 92%	RUN 16				HARD ROCK: Light to dark gray, moderately to very slightly weathered, very close to wide fracturing, medium hard to hard, BIOTITE GNEISS (continued) (2 joints at 45°, open with trace staining; 2 joints at 60°, open with trace orange staining)
197,8	124.0	5.0	1:30 1:54 1:35 1:42	(4.8) 96%	(4.8) 96%	RUN 17				(1 joint at 45°, open; 2 joints at 60°, open; 0.4 ft thick quartz vein between 128.0 and 129.0 feet)
192.8	129.0	5.0	3:22 2:17 2:23 0:00 1:57	(3.9) 78%	(2.6) 52%	RUN 18				(3 joints at $45^\circ,$ open; severely weathered, very soft zone from 130.0-131.0 ft)
187.8	134.0	5.0	2:36 2:31 2:09 3:05 1:33	(5.0) 100%	(4.8) 96%	RUN 19				(2 joints at 45°, open with trace weathered rock; 1 joint at 75°, open with trace orange staining)
182.8	139.0	5.0	1:33 1:28 1:43 1:57 1:47	(5.0) 100%	(5.0) 100%	RUN 20				(2 joints at 45°, light; several mechanical fractures)
177.8	144.0	5.0	1:37 2:35 2:04 2:12 2:20	(5.0) 100%	(5,0) 100%	RUN 21				(fractures are mechanical)
172.8	149.0	5.0	1:35 1:57 2:03 2:15 2:04	(4.6) 92%	(2.0) 40%	RUN 22				(8 joints at 45°, open with trace weathered rock; 0.8 ft thick severely weathered, very soft zone from 151.0 to 152.0 feet)
167.8	154.0	-	2:30			-		-	114	167.8 Boring and coring terminated at 154.0 feet.
										Boring closed by tremie method with cement-bentonite grout.
										24 hour water level measured on 9/15/2009 prior to drilling. Borehole was at a depth of 119.0 feet.

North Anna 3 Project MACTEC Project No. 6468-09-2473





M-4 – Box 2



M-4 - Box 3



M-4 - Box 4

North Anna 3 Project MACTEC Project No. 6468-09-2473

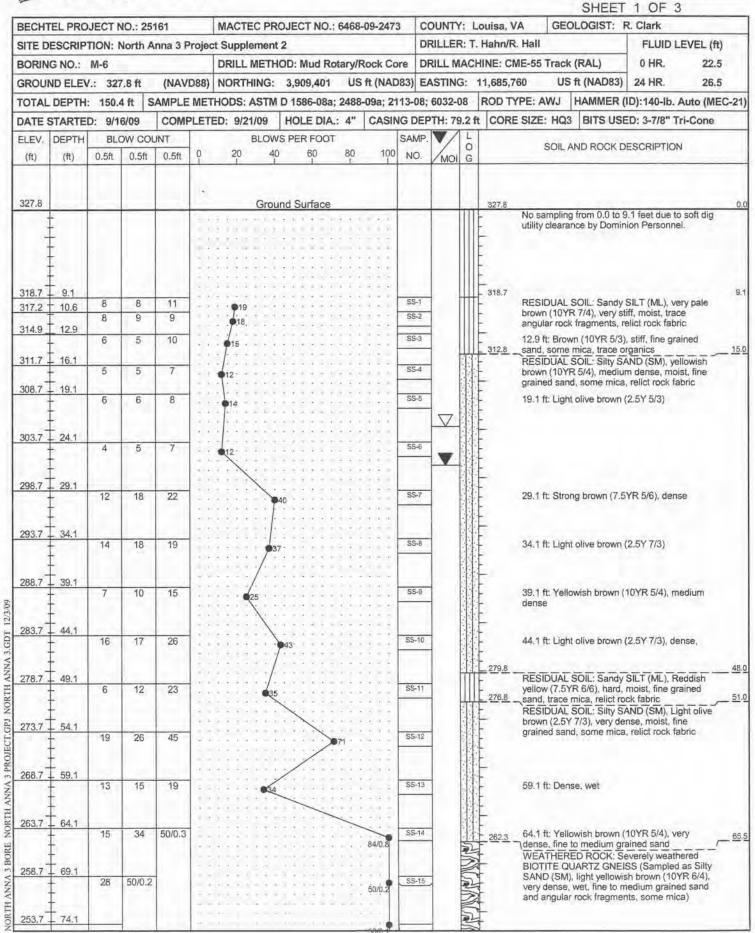
	*	NORTH ANNA 3 PROJECT 6468-09-2473	Ran	RECOVERY	RQD	
.*	San San I	A-4 -	300 20 (01.06 100.00) Barto (00 - 6 100.00) Barto (00 - 6 100.00)	50.ft (100/2) 19.0 ft (100/2) 19.16 (1112)	20% (44%) 20% (44%) 20%	
A Danie and		Millet: 134-9 fo 124+ fe		- Aller	1200	5.0 -1
and the state of the second						
and a strength	and can d	anetala in canetana).	1.1.1.1.1.1. W 1.1.1	ademi deval	ate Martin Conference of	
		and an an and an and an and an		adental stated	ada wa cabata da a	ina fa d'antin
		anna a carsonal				-1-1-1-0-0

M-4 - Box 5



Prepared By JJJ Date 12/16/09

Checked By MAn_ Date 12/16/09



Volume 1, Revision 0



SHEET 2 OF 3

BECHTEL PROJECT NO.: 25161 MACTEC PROJECT NO.: 6468-09-24										SHEET 2 OF 3 473 COUNTY: Louisa, VA GEOLOGIST: R. Clark						
						MACTEC PR		6468	-09-2473							
			North /	Anna 3 F	Proje	ct Supplement							T. Hahn/R. Hall FLUID LEVEL (ft)			
BORIN	IG NO.:	M-6				DRILL METH	IOD: Mud Ro			_			HINE: CME-55 Track (RAL) 0 HR. 22.5			
GROU	ND ELE	V.: 327	7.8 ft	(NAV	D88)	88) NORTHING: 3,909,401 US ft (NAD8					ASTING	G: 1	11,685,760 US ft (NAD83) 24 HR. 26.5			
TOTAL	DEPTH	: 150.4	4ft S	SAMPLE	ME	THODS: ASTM	D 1586-08a;	2488	-09a; 211	3-08	; 6032-0	8	ROD TYPE: AWJ HAMMER (ID):140-Ib. Auto (MEC-			
DATE	STARTE	D: 9/1	6/09	COM	PLET	ED: 9/21/09	HOLE DIA .:	4"	CASIN	G DE	PTH: 79	.2 ft	ft CORE SIZE: HQ3 BITS USED: 3-7/8" Tri-Cone			
ELEV.	DEPTH	BLC	ow co	UNT		BLOW	S PER FOOT			SAMP	. V/	L				
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20 40	60	80	100	NO.	MOI	O G				
					1											
253.0		50/0.1			+	Continued f	rom previous	page	· · · / /	SS-16		5				
	‡	50/0.1			1::				::			3	to be			
248.7	79.1								::1			5	248.6			
	+	50/0.1	1		1.				50/0.1	SS-17			HARD ROCK: Light gray with orange and			
	Ŧ				111				111				reddish brown staining, moderately severely to moderately weathered, close to moderately			
	t				1.0				1 . X X				close fracturing, soft to medium hard, BIOTITE QUARTZ GNEISS with trace magnetite			
	ł															
	‡				1								Ş.			
-	t															
	F			1	1.1								\$			
	‡								1111				(L)			
-	+											111	£			
	Ţ				1::								4			
	t						******						\$			
	+															
	‡												¥			
	t				1.0								ŧ			
-	+				10								<u>}</u>			
	‡								:::				(F			
	t												<u>注</u>			
-	Ŧ												-			
	‡												Ϋ́			
	t				1.											
-	Ŧ												HARD ROCK: Light gray and black, with reddish brown staining, moderately weathered,			
	t					******							close to moderately close fracturing, medium			
	t												hard to moderately hard, QUARTZ BIOTITE GNEISS with trace hornblende			
_	‡				1 : :				:::				<i>(</i> -			
	t					* * * * * * *							注			
	Ŧ				1::											
	‡								:::				¥			
	t							· · ·					\$			
	Ŧ				1::								201.4			
	‡.				1	*******	*****						HARD ROCK: Gray to light gray, trace pink, fresh, close to wide fracturing, very hard,			
	+				1.								BIOTITE QUARTZ GNEISS with trace			
	Ţ				1								magnetite			
	‡												往			
	+												*			
	Ţ				1.								4			
_	t												注			
	÷												4			
	‡				1	******	******		:::				Š.			
	+															
-	Ŧ			1					1111				¥			
	t				• •								往			
	ł								1.1				*			
	İ								1.2.1							



BECHI	TEL PRO	JECT N	10.: 25	161		MACTEC PR	ROJECT NO .:	6468	-09-2473	C	OUNTY	: L	ouisa, VA	GEO	LOGIST: F	R. Clark	
SITE D	ESCRIP	TION: N	North A	nna 3 P	roje	ct Supplemen	t 2		D	RILLER	2: T.	Hahn/R. Hall		FLUID LEVEL (ft)			
BORIN	G NO.:	M-6				DRILL METH	HOD: Mud Ro	tary/F	Rock Cor	e D	RILL M	ACH	HINE: CME-55 T	rack	0 HR.	22.5	
	ND ELEN		.8 ft	(NAV	D88)	NORTHING:	3,909,401	US	ft (NAD	33) E	ASTING	3: 1	11,685,760	US	ft (NAD83)	24 HR.	26.5
OTAL	DEPTH	: 150.4	ft S	AMPLE	MET	HODS: ASTN	D 1586-08a;	2488	-09a; 211	3-08	6032-0	8	ROD TYPE: AV	NJ	HAMMER (D):140-lb.	Auto (MEC-
	STARTE			1		ED: 9/21/09	HOLE DIA.		1	-		_	CORE SIZE:				
LEV.	DEPTH		W CO				VS PER FOOT			SAMP	Trees A	L		-			
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20 4	0 60	80	100	NO.	MOI	O G	5	SOIL A	ND ROCK D	ESCRIPTION	4
				6					1								
						Q-12-12											
78.2	-	-	_	-		Continued	from previous	page	3	-		111	- 177.4				1
1														and c	oring termina	ted at 150.4	
A CONTRACTOR OF													Boring	closed	d by tremie m onite grout	ethod with	



SHEET 1 OF 1

BECHTEL PROJECT NO.: 25161		MACTEC PRO	COUNTY: Louisa, VA	GEOLOGIST: I	R. Clark			
SITE DESCRIPTION: North Anna	3 Projec	t Supplement 2	DRILLER: T. Hahn/R. Hall	FLUID LEVEL (ft)				
BORING NO .: M-6		DRILL METHON	D: Mud Rota	ary/Rock Core	DRILL MACHINE: CME-55	Track (RAL)	0 HR.	22.5
GROUND ELEV .: 327.8 ft (N	AVD88)	NORTHING: 3	3,909,401	US ft (NAD83)	EASTING: 11,685,760	US ft (NAD83)	24 HR.	26.5
TOTAL DEPTH: 150.4 ft S	SAMPLE	METHODS: AST	M D 1586-0	8a; 2488-09a; 2	113-08; 6032-08): 140-lb. Auto (MEC-21)		
DATE STARTED: 9/16/09 C	OMPLET	FED: 9/21/09	CASING D	EPTH: 79.2 ft	CORE BARREL TYPE: Wire	eline HQ3 Triple	Tube, series 6	& 10 bits

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RQD (ft) %	L O G	DESCRIPTION AND REMARKS	
					•					Begin Coring @ 79.2 ft	
248.6 246.4	79.2 81.4	2.2 5.0	1:15 1:17 0:18/0.2 1:11 1:03 0:45	(2.2) 100% (5.0) 100%	(1.1) 50% (4.7) 94%	RUN 1 RUN 2	(25.8) 80%	(18.0) 56%		 ^{248.6} HARD ROCK: Light gray with orange and reddish brown staining, moderately severely to moderately weathered, close to moderately close fracturing, soft to medium hard, BIOTITE QUARTZ GNEISS with trace magnetite (3 joints at 0-10°, open; quartz vein at 60° from 80.1-80.3 ft) (2 joints at 45°, tight) 	/
241.4	86.4	5.0	0:55 0:58 1:08	(3.9)	(0.9)	RUN 3				(4 joints at 0-10°, tight; 2 joints at 85-90°, tight with trace iron staining)	
236.4	91.4	0.0	0:59 0:58 1:02 1:04	78%	18%						
		5.0	1:28 1:31 1:28 1:26	(2.6) 52%	(1.5) 30%	RUN 4				(3 joints at 0-10°, tight with trace iron staining)	
231.4	96.4	5.0	1:35 1:25 1:33 1:24 1:21	(4.7) 94%	(2.7) 54%	RUN 5				(2 joints at 0-10°, tight with trace clay; 2 joints at 75°, tight with trace iron staining)	
226.4		5.0	1:12 1:21 1:02 1:03 1:05	(2.6) 52%	(2.6) 52%	RUN 6				(1 joint at 45°, tight with trace iron staining; 1 joint at 75°, with trace clay and iron staining)	
221.4	106.4	5.0	1:08 1:21 1:07 1:14 1:05	(4.8) 96%	(4.5) 90%	RUN 7				(1 joint at 0°, open; 2 joints at 60°, tight; 1 joint at 90°, tight)	
216.4	111.4	5.0	1:01 1:11 1:14 1:26 1:28	(4.1) 82%	(3.3) 66%	RUN 8	(14.1) 94%	(11.7) 78%		216.4 HARD ROCK: Light gray and black, with reddish brown staining, moderately weathered, close to moderately close fracturing, medium hard to moderately hard, QUARTZ BIOTITE GNEISS with trace homblende (2) isite at 45° is instructive to some staining 4 light at 45° is instructive to some some staining 4 light with trace insp.	1
211.4	116.4	5.0	1:31 1:11 1:45 1:45 1:52	(5.0) 100%	(4.2) 84%	RUN 9				 (2 joints at 45°, tight with trace iron staining; 1 joint at 60°, tight with trace iron staining) (2 joints at 45°, tight with iron staining) 	
206.4	121.4	2.0	1:37	(2.0)	(1.6)	RUN 10				(2 joints at 0-10°, tight; 2 joints at 60°, tight; foliation at 60° to core axis)	
204.4	123.4	3.0	5:06 4:49 3:17	100%	80% (2.6) 87%	RUN 11	-			(6 joints at 60°, tight with trace iron staining)	
201.4	126.4	5.0	3:43 3:42 4:12 7:18 8:45	100% (5.0) 100%	(5.0) 100%	RUN 12	(23.8) 99%	(23.1) 96%		201.4 HARD ROCK: Gray to light gray, trace pink, fresh, close to wide fracturing, very hard, BIOTITE QUARTZ GNEISS with trace magnetite (foliation at 60° to core axis)	1
196.4	131.4	5.0	8:04 5:26 5:16 5:22 5:15	(5.0) 100%	(5.0) 100%	RUN 13				(1 joint at 50°, tight)	
191.4	136.4	5.0	5:28 5:15 6:19 7:20 6:28	(5.0) 100%	(4.5) 90%	RUN 14				(2 joints at 0°, tight; 2 joints at 20°, tight; 2 joints at 45°, tight)	
186.4	141.4	5.0	7:17 7:29 7:12 6:25	(4.9) 98%	(4.7) 94%	RUN 15				(4 joints at 0-10°, tight with iron staining; 1 joint at 15°, tight; 1 joint at 30°, tight)	
181.4		4.0	6:48 6:33 9:34 11:25 8:11	(3.9) 98%	(3.9) 98%	RUN 16				(No joints)	
177.4	150.4		12:08							Boring and coring terminated at 150.4 feet.	1
										Boring closed by tremie method with cement-bentonite grout.	

Volume 1, Revision 0

North Anna 3 Project MACTEC Project No. 6468-09-2473



M-6 - Box 4

North Anna 3 Project MACTEC Project No. 6468-09-2473

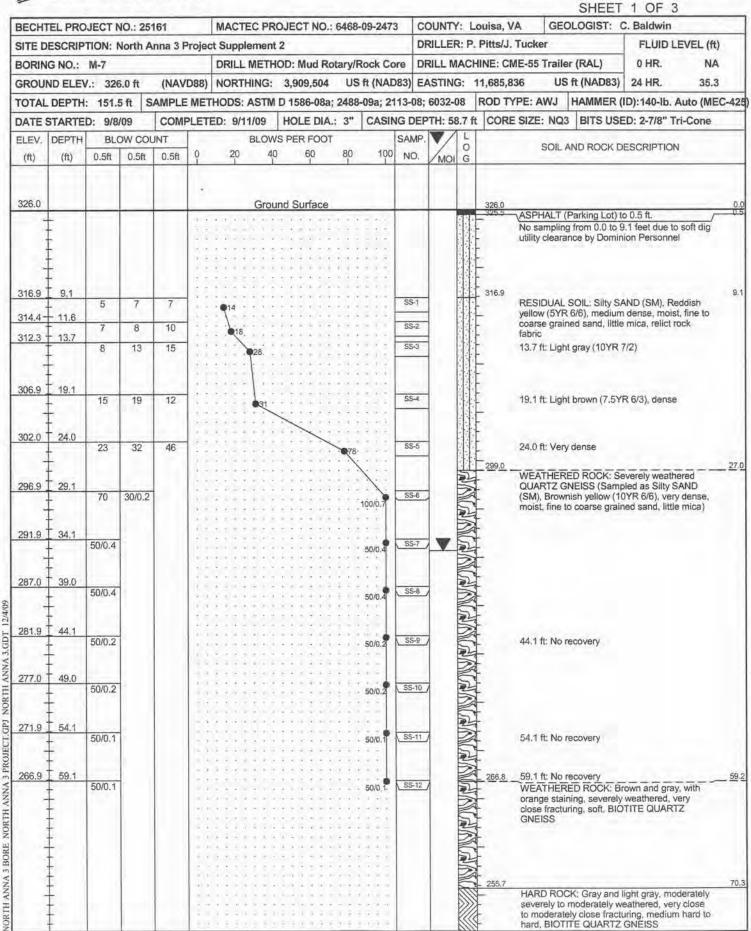


M-6 - Box 5



Prepared By JJJ Date 12/16/09

Checked By Man Date 216/09







																			2 OF 3	
BECHT	TEL PRO	JECT N	10.: 25	161		MAC	TEC PR	OJECT	NO.: 6	6468-	09-247	3 C	OUNT	/: L	ouisa, V	A G	GEOL	OGIST:	C. Baldwin	
SITE D	ESCRIP	TION: N	North A	nna 3 F	rojec	ct Sup	plement	12				D	RILLEF	R: P.	Pitts/J.	Tucker			FLUID LEV	EL (ft)
BORIN	G NO.:	M-7				DRIL	LMETH	IOD: Mu	ud Rota	ary/R	Rock Co	re D	RILL M	AC	HINE: CM	IE-55 Tra	ailer	(RAL)	0 HR.	NA
	ND ELEV		5.0 ft	(NAV	D88)		THING:								11,685,83			t (NAD83)	24 HR.	35.3
	DEPTH			AMPLE								1			ROD TY		_		(ID):140-Ib. Aut	o (MEC
	STARTE				_	ED: 9	Contraction of the local division of the loc		DIA.:		1				t CORE				ED: 2-7/8" Tri-C	
	DEPTH		DW CO			LD. 3/		/S PER		5	CAOI	SAMP.	Tantan /	L		0126.11	10(0	5110 00	LD. 2-770 111-0	one
		0.5ft	0.5ft	0.5ft	o	20			0	80	100	NO.	1	0		SO	DIL AN	ID ROCK E	DESCRIPTION	
(ft)	(ft)	0.511	0.51	0.51	ļĭ_	ī	Î		l			NO.	/MOI	G						
251.2						Con	tinued f	rom pre	evious	page	•									
_	-													$\langle \rangle \rangle$	_	HARD R	ROCK	Gray and	light gray, modera eathered, very clo	itely
-	t l				::										1	to moder	rately	close fract	uring, medium ha	rd to
	+							* * *							246.0				GNEISS (continu	
	F				::									2					rayish brown with weathered, very	
	‡				11						:::				-	close to	close	fracturing,	very soft, QUART	Z
	t l				::			· · · ·						2	ŀ	BIOTITE	GNE	:155		
-	+				::										F					
	F				1.1									2	000 7					
	‡													M	- 236.7				ayish brown with	
-	t l				11			· · · · · ·							-				ely severely to ery close to close	
	t l														t	fracturing	g, me	dium hard,	QUARTZ BIOTIT	E
	F				1::										}	GNEISS				
	t l				1.			 							F					
	‡				11										227.0	14/2 1		Deeri		
	t l				::									2	-				everely weathered SS (No Recovery	
-	F													R						
	F				1.1										222.0	HARDP	20CK	Orange by	rown to greenish g	irav
2	‡														219.7	with oran	nge st	aining, mo	derately severely	to
	t l				::										t	fracturing	g, me	dium hard	ery close to close to moderately han	d.
	+														Ł	QUARTZ	Z BIO	TITE GNE	ISS (2 joints at 20 t 40°, tight; 1 joint	°,
_	F				1.										+	70°, ope	en)	-		
	‡														F				trace orange stain close to moderate	
	t l										* * *					close fra	cturin	g, moderat	ely hard, QUART	Ź
-	t l														_ 209.7	HARD R			ht gray and grayis	sh
	F														}	brown, w	vith or	ange staini	ing, moderately to	
	‡				1.									\mathbb{K}	£	fracturing	g, mo		close to close rd, BIOTITE QUA	RTZ
-	†)))		GNEISS	5	-		
	t				11	: : :									ł					
	ł													V//	1					
	ŧ.				• •										F					
	‡														1					
	t																			
	ł														1					
	Ŧ														F					
	‡									· · ·					ţ.					
	t				:										ł					
	F				· ·									$\ $	ł					
-	‡													\mathbb{Z}	184.7					
	t				1.1										1	HARD R grav. ver	ROCK	: White, pir	nk, and gray to light ered, close fractur	nt ing,
	+								• • •						ł	hard, BI	OTITI	E QUARTZ	GNEISS and	
-	F														F			aphic quart and magnet	z + feldspar vein ite	WILLI
	‡														ŧ	0				
	+				· ·									6)))	₹					





															SHEET	3 OF 3	3	
BECHT	EL PRO	DJECT I	NO.: 25	161		MACTEC PR	OJECT NO .:	6468-	-09-2473	3	COUNT	Y: L	.ouisa, VA	GEC	DLOGIST: 0	C. Baldwin		
SITE D	ESCRIF	TION:	North A	nna 3 P	roje	ct Supplement	2				DRILLE	R: P	. Pitts/J. Tucke	r		FLUID L	EVEL ((ft)
BORIN	G NO.:	M-7				DRILL METH	OD: Mud Rot	ary/F	Rock Co	ore	DRILL	MAC	HINE: CME-55	Traile	r (RAL)	0 HR.	N	A
GROUI	ND ELE	V.: 32	6.0 ft	(NAVI	D88)	NORTHING:	3,909,504	US	ft (NAE	083)	EASTIN	IG:	11,685,836	US	ft (NAD83)	24 HR.	35	5.3
TOTAL	DEPTH	ł: 151.	5 ft S	AMPLE	ME	THODS: ASTM	D 1586-08a;	2488	-09a; 21	13-0	8; 6032	-08	ROD TYPE: A	WJ	HAMMER (D):140-lb.	Auto (N	AEC-4
DATE	STARTE	ED: 9/8	/09	COMF	LET	ED: 9/11/09	HOLE DIA .:	3"	CASI	IG D	EPTH: 5	58.7 f	t CORE SIZE:	NQ3	BITS USE	D: 2-7/8" T	ri-Cone	9
ELEV.	DEPTH	BL	ow co	UNT			S PER FOOT			SAM	P. 💙	LO		SOILA	ND ROCK D	ESCRIPTION	J	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	Ŷ	20 40	60	80	100	NO	. /мо	G						
176.4					•	Continued fr	om previous	nane	2									
		+											174.5					15
-												->>>		g and o	coring termina	ted at 151.5	feet.	
-	F														d by tremie m	nethod with		
-	ŧ.												cemei	nt-ben	tonite grout.			
-	ŧ												24 ho	ur wate o drillir	er level measung. Borehole	ured on 9/11/ was at a dep	2009 th of	
-	ŧ												136.3	feet.			100	
	ŧ												-					
	ŧ												-					
_	È.												-					
	t i												-					
-	Ł												-					
-	-												-					
-	F												-					
	F												F					
-	Ŧ												-					
	ŧ.												Ē					
1	1												-					
	±												-					
	t												-					
-	<u> </u>												-					
	Ŧ												-					
	Ŧ												-					
	ŧ												-					
	†												-					
	t.												-					
	t												-					
	1												L					
-	-												-					
	Ŧ												-					
	Ŧ												F					
-	Ŧ												F					
	‡												F					
-													F					
-	±												E .					
	t												È.					
-	t												-					
	Ŧ												F					
	Ŧ												F					
	ŧ.												F					
	t												E					



SHEET 1 OF 2

BECHTEL PROJECT NO.: 2516	1	MACTEC PRO	JECT NO .:	6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST: 0	C. Baldwin	
SITE DESCRIPTION: North Ann	na 3 Projec	t Supplement	2		DRILLER: P. Pitts/J. Tuck	er	FLUID LE	EVEL (ft)
BORING NO.: M-7		DRILL METHO	DD: Mud Rot	ary/Rock Core	DRILL MACHINE: CME-55	Trailer (RAL)	0 HR.	NA
GROUND ELEV .: 326.0 ft	(NAVD88)	NORTHING:	3,909,504	US ft (NAD83)	EASTING: 11,685,836	US ft (NAD83)	24 HR.	35.3
TOTAL DEPTH: 151.5 ft	SAMPLE	METHODS: AS	TM D 1586-0)8a; 2488-09a; 2	113-08; 6032-08	HAMMER (ID):	140-lb. Auto (MEC-425)
DATE STARTED: 9/8/09	COMPLE	TED: 9/11/09	CASING D	DEPTH: 58.7 ft	CORE BARREL TYPE: Wi	reline NQ3 Triple	Tube, series 6	bit

ELEV.		RUN	DRILL RATE	REC. (ft) %	JN RQD (ft) %	SAMP.	STR REC.	RQD	L	DESCRIPTION AND REMARKS	
(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(II) %	NO.	(ft) %	(ft) %	G		
		0.4	0:50/1.1	(0.4)	(0.0)	RUN 1	(0.4)	(0.0)	5	Begin Coring @ 59.2 ft 206.8 WEATHERED ROCK: Brown and gray, with orange staining, severely	59.2
266.8 264.7 264.2	61.3		1:03 0:23/0.5	(0.4) 19% (0.0)	(0.0) 0% (0.0)	RUN 2	4%	0%		weathered, very close fracturing, soft, BIOTITE QUARTZ GNEISS (1 joint at 0°, open)	
		5.0	1:35 1:57 2:14 2:00	0% (0.0) 0%	0% (0.0) 0%	RUN 3				(No Recovery) (No Recovery)	
259.2	66.8	4.5	2:15	(1.0)	(0.0)	RUN 4			5		
		4.0	1:45 1:54 4:51	22%	0%					255.7	70.3
254.7	71.3	5.0	4:00/0.5 3:53 3:44 3:15 3:09	(4.8) 96%	(3.6) 72%	RUN 5	(9.5) 98%	(5.7) 59%		HARD ROCK: Gray and light gray, moderately severely to moderately weathered, very close to moderately close fracturing, medium hard to hard, BIOTITE QUARTZ GNEISS (4 joints at 0°, open; 3 joints at 70-80°, tight) (3 joints at 0°, tight; 2 joints at 60°, tight; 2 joints at 80°, tight)	
249.7	76.3	5.0	3:09 3:20 3:30 3:30	(3.7) 74%	(2.1) 42%	RUN 6				(4 joints at 0°, open; 2 joints at 45°, tight; 2 joints at 60-70°, tight)	
244.7	81.3		3:00				(0.2)	(0.0)	5	246.0 WEATHERED ROCK: Gravish brown with orange staining, severely weather	80.0 red,
244.7	81.3	5.0	2:40 2:10 2:07 2:00	(0.2) 4%	(0.0) 0%	RUN 7	2%	0%	AVVVA	very close to close fracturing, very soft, QUARTŽ BIOTITĚ GNEISS (1 joint at 40°, open with clay; poor recovery)	
239.7	86.3	5.0	3:32 2:37	(2.0)	(0.8)	RUN 8					
			2:43 2:32	40%	16%				R	236.7	89.3
234.7	91.3	5.0	3:37 3:28 3:09 3:30	(3.5) 70%	(0.4) 8%	RUN 9	(8.2) 85%	(2.4) 25%		HARD ROCK: Gray to grayish brown with orange staining, moderately seven to moderately weathered, very close to close fracturing, medium hard, QUA BIOTITE GNEISS	rely RTZ
229.7	96.3		4:20 3:53 3:36	70%	070					(4 joints at 50°, tight) (6 joints at 0°, tight; 4 joints at 60°, tight)	
		5.0	3:20 3:08 3:20	(2.7) 54%	(1.2) 24%	RUN 10				(4 joints at 10°, tight; 2 joints at 50°, tight; 1 joint at 90°, tight) 227.0	99.0
224.7	101.3		2:50 1:35				(0.0) 0%	(0.0) 0%	2M	WEATHERED ROCK: Severely weathered, QUARTZ BIOTITE GNEISS (N Recovery)	D
224.7		5.0	2:55 2:14 4:30	(2.3) 46%	(1.7) 34%	RUN 11			S	222.0	104.0
219.7	106.3		3:17 3:28				(2.3) 100%	(1.7) 74%		HARD ROCK: Orange brown to greenish gray with orange staining, modera 219.7 severely to moderately weathered, very close to close fracturing, medium has	ard 106.3
		5.0	3:54 3:32 3:55	(4.8) 96%	(4.4) 88%	RUN 12	(9.8) 98%	(9.1) 91%		to moderately hard, QUARTZ BIOTITE GNEISS (2 joints at 20°, open with o 2 joints at 40°, tight; 1 joint at 70°, open) HARD ROCK: Gray with trace orange staining, slightly weathered, very clos	
214.7	111.3		3:55 3:43							moderately close fracturing, moderately hard, QUARTZ BIOTITE GNEISS (2 joints at 40°, tight; 1 joint at 70°, tight)	0.10
		5.0	4:26 4:14 3:57 4:16	(5.0) 100%	(4.7) 94%	RUN 13				(5 joints at 20-30°, tight; 6 joints at 40-50°, tight)	
209.7	116.3	5.0	4:30 4:58	(4.7)	(3.4)	RUN 14	(24.7)	(18.5)		HARD ROCK: Gray to light gray and grayish brown, with orange staining,	116.3
CUNN			4:38 4:40 4:00	94%	68%		99%	74%		moderately to slightly weathered, very close to close fracturing. moderately hard, BIOTITE QUARTZ GNEISS (1 joint at 20°, tight; 3 joints at 50°, tight; 1 joint at 90°, tight)	
204.7	121.3	5.0	2:53 2:40	(5.0)	(3.7)	RUN 15	-			(1 joint at 20, tight, 5 joints at 50, tight, 1 joint at 50, tight) (3 joints at 0-10°, tight to open; 5 joints at 20-30°, tight; 1 joint at 80°, tight)	
209.7 204.7 199.7 194.7	400.0		2:22 2:15 2:19	100%	74%						
199.7	126.3	5.0	2:27 2:40 2:27 3:42	(5.0) 100%	(3.4) 68%	RUN 16	-			(5 joints at 0-10°, tight; 3 joints at 20-30°, tight; 2 joints at 40-50°, tight; 1 join 70°, tight)	nt at
194.7	131.3	5.0	3:35 3:33 3:37	(5.0)	(4.7)	RUN 17	-			(3 joints at 0-10°, tight; 1 joint at 40°, tight; 1 joint at 70°, tight)	
NOL			3:34	100%	94%						

Volume 1, Revision 0

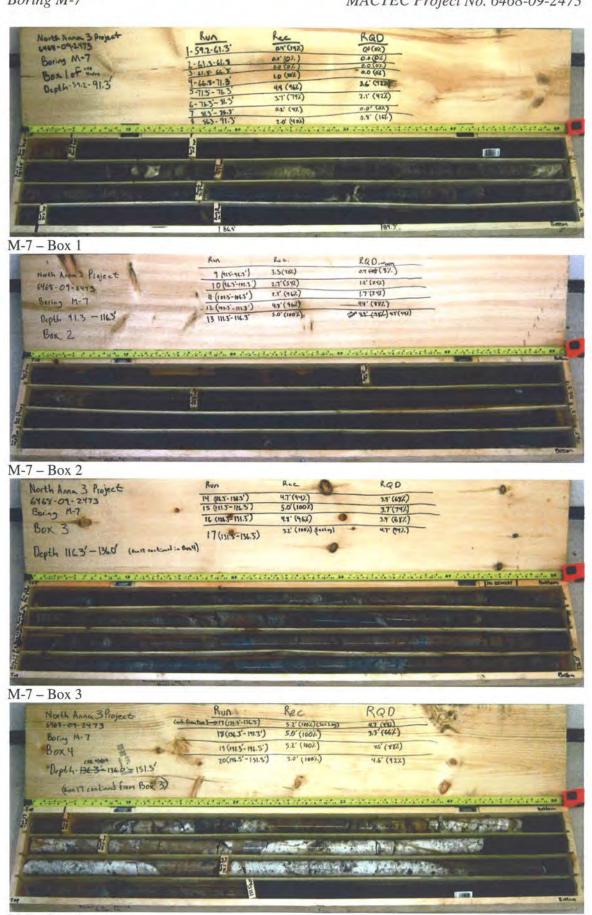


BECHTEL PROJECT NO.: 25161		MACTEC PRO	DJECT NO .: (6468-09-2473	COUNTY:	Louisa, VA	GEOLOGIST: 0	C. Baldwin	
SITE DESCRIPTION: North Anna	a 3 Projec	t Supplement	2		DRILLER:	P. Pitts/J. Tucke	r	FLUID L	EVEL (ft)
BORING NO .: M-7		DRILL METHO	DD: Mud Rot	ary/Rock Core	DRILL MA	CHINE: CME-55	Trailer (RAL)	0 HR.	NA
GROUND ELEV .: 326.0 ft (M	NAVD88)	NORTHING:	3,909,504	US ft (NAD83)	EASTING:	11,685,836	US ft (NAD83)	24 HR.	35.3
TOTAL DEPTH: 151.5 ft S	SAMPLE	METHODS: AS	STM D 1586-0)8a; 2488-09a; 2	113-08; 603	2-08	HAMMER (ID):	: 140-lb. Auto	(MEC-425)
DATE STARTED: 9/8/09	COMPLET	TED: 9/11/09	CASING E	DEPTH: 58.7 ft	CORE BAR	RREL TYPE: Wire	eline NQ3 Triple	Tube, series 6	bit

ELEV.	DEPTH	RUN	DRILL	RU	JN	SAMP.	STR	ATA	L			
(ft)	(ft)	(ft)	RATE (Min/ft)	REC. (ft) %	RQD (ft) %	NO.	REC. (ft) %	RQD (ft) %	0 G		DESCRIPTION AND REMARKS	
					`						Continued from previous page	
189.7	136.3	5.0	3:50 3:47 3:18 6:00 5:30 5:45 6:05	(5.0) 100%	(3.3) 66%	RUN 18					HARD ROCK: Gray to light gray and grayish brown, with orange staining, moderately to slightly weathered, very close to close fracturing, moderately hard, BIOTITE QUARTZ GNEISS (<i>continued</i>) (7 joints at 10-20°, tight to open; 4 joints at 30-40°, tight; 1 joint at 70°, tight)	
184.7	141.3	5.2	8:00 10:40 9:05 8:36 10:43	(5.2) 100%	(4.6) 88%	RUN 19	(10.2) 100%	(9.2) 90%		184.7	HARD ROCK: White, pink, and gray to light gray, very slightly weathered, close fracturing, hard, BIOTITE QUARTZ GNEISS and pegmatitic, graphic quartz + feldspar vein with trace garnet and magnetite (4 joints at 0-10°, tight; 4 joints at 20-30°, tight)	14
179.5	146.5	5.0	14:25/1.2 16:05	(5.0)	(4.6)	RUN 20			\gg		(4 joints at 0-10°, tight; 4 joints at 20-30°, tight; 3 joints at 40-50°, tight)	
		5.0	11:38 8:52 5:15	100%		101120						15
174.5	151.5		10:00						1111	- 174.5	Boring and coring terminated at 151.5 feet.	15
										-	Boring closed by tremie method with cement-bentonite grout.	
										-	24 hour water level measured on 9/11/2009 prior to drilling. Borehole was at a depth of 136.3 feet.	
										-		
										-		
										-		
										F		
										-		
										-		
										-		
										-		
										-		
										-		
										-		
										-		
										-		
										Ē		
										-		
										ţ.		

Core Photographs Boring M-7

North Anna 3 Project MACTEC Project No. 6468-09-2473



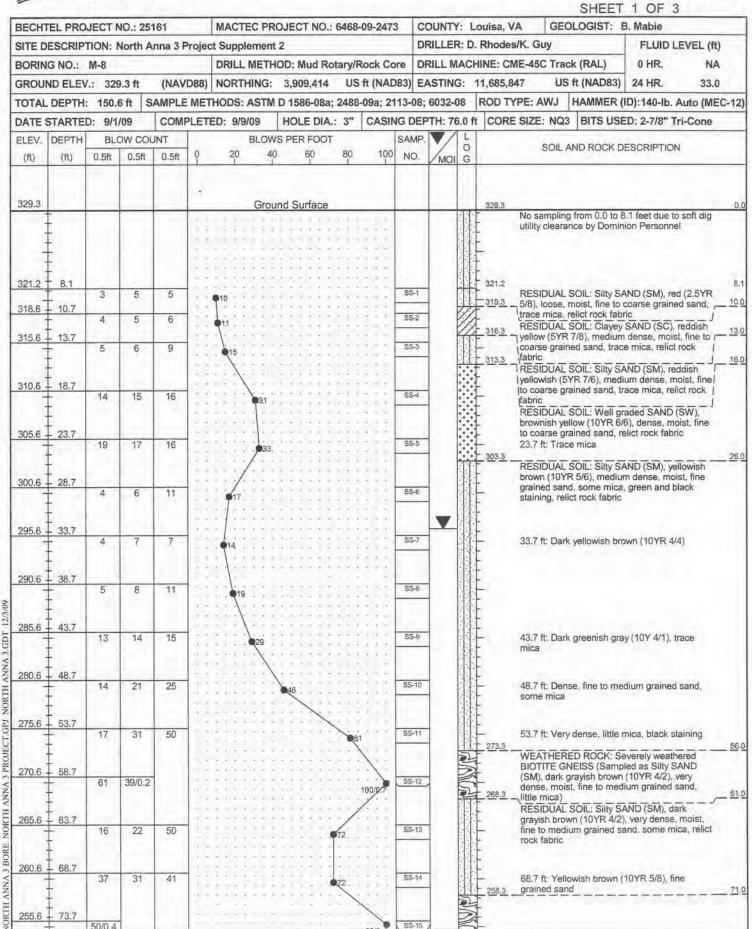
M-7 - Box 4

MACTEC

GEOTECHNICAL BORING LOG

Prepared By JJJ Date 12/16/09

Checked By Mign Date 12/16/09



Volume 1, Revision 0



															SHEET		3	
BECHT	TEL PRO	JECT N	10.: 25	5161		MACTEC PR	OJECT NO .:	6468-	-09-2473				,		LOGIST: E			
SITE D	ESCRIP	TION: N	North /	Anna 3 F	Proje	ct Supplement	2			D	RILLER	: D.	Rhodes/K. Guy	/		FLUID	LEVEL ((ft)
BORIN	IG NO.:	M-8				DRILL METH	OD: Mud Ro	otary/F	Rock Co	re D	RILL MA	ACH	HINE: CME-45C	Trac	k (RAL)	0 HR.	N	A
GROU	ND ELE	V.: 329	.3 ft	(NAV	D88)	NORTHING:	3,909,414	US	ft (NAD	83) E	ASTING	: 1	11,685,847	US	ft (NAD83)	24 HR.	33	3.0
TOTAL	DEPTH	1: 150.0	oft s	SAMPLE	ME	THODS: ASTM	D 1586-08a	2488	-09a; 21	13-08	; 6032-08	8	ROD TYPE: AV	VJ	HAMMER (I	D):140-lb	Auto (N	IEC
DATE	STARTE	D: 9/1	/09	COM	PLET	ED: 9/9/09	HOLE DIA	: 3"	CASIN	IG DE	PTH: 76.	.0 ft	CORE SIZE:	NQ3	BITS USE	D: 2-7/8"	Tri-Cone)
ELEV.	DEPTH	BLO	DW CO	UNT	Γ	BLOW	S PER FOOT			SAMP	. V/	L						
(ft)	(ft)	0.5ft	0.5ft	0.5ft	ļ	20 40	60	80	100	NO.	MOI	0 G	S	OILA	ND ROCK DI	ESCRIPTIC	DN	
254.5					+	Continued f	rom previou:	s page	• • • • • •			2	- WEATI	HERE	D ROCK: Se	verely weat	thered	_
	t				1			111	11			3	BIOTIT	EQU	ARTZ GNEIS D (SW), pale	SS (Sample	d as Well	
250.6	78.7	50/0.2			1::					SS-16		5	very de	nse, v	vet, fine to co	arse graine	ed sand,	
	ŧ	50/0.2			· ·				50/0.2	00-10	1 8	5			ck fragments rely weathere			
	t											5	GNEIS	S (Sai	mpled as Silt	y SAND (SI	M),	
245.6	83.7	50/0.0						· · ·	50/0.0	SS-17		5			wn (10YR 5/4 e mica, little			1
242.9	86.4	50/0.0							50/0.0	0.5-17				throug	gh entire run)			
242.9	86.4	50/0.0							50/0.0	SS-18		11	86.4 ft:	No Re	ecovery			Γ
	t												and a state of a state	ROCK	C: Light gray	with orange	staining,	
	Ŧ											555	close fr	acturi	evere to mod ng, medium h			Г
	‡											5	QUAR			Voreluure	hored	
	t											M			D ROCK: Se ARTZ GNEIS			Г
-	F				1 : :								- HARD	ROCK	K: Light gray,	brown, tan,	and light	
	‡												- slightly	weath	range stainin nered, close f	racturing, m	nedium	
	t													mode	erately hard, E			
	F				1								GNEIS	0				
	‡												-					
-	t												-					
	+				1								-					
	Ŧ												-					
1	‡												t_					
	t				1:				:::				Ł					
	Ŧ												216.3					
_	‡											2	WEAT		D ROCK: Se ARTZ GNEIS			
	t								:::			2	213.1					
	Ŧ				1										K: Light brown staining, mod			
_	‡												_ weathe	red, c	lose fracturin	g, moderate		
	t								· · · ·				L BIOTIT	EQU	ARTZ GNEIS	5		
	Ŧ				1:								206.6		D DOOK O	Vorel	thornal	
_	‡											4			D ROCK: Se ARTZ GNEIS			
	t				1:			· · · ·					203.1					
	+				1:								HARD	ROCH	K: Light brown ange staining	n, gray, and , moderatel	l light y severe	
_	‡								***				L to mod	eratel	y weathered,	close fractu	uring,	
	t				1.								L mediur GNEIS		to hard, BIO	ULE QUA	12	
	t				:								1					
_	Ŧ												F					
	‡				1								ļ.					
	+				1	 							+					
-	Ŧ												Į.					
	t					 												
	+				1		* * * * * *						+					
-	‡											\gg	F .					
	t				1								ŧ					
	÷				:							\gg	+					
	t				1	<u></u>			6.9.5				<u> </u>					



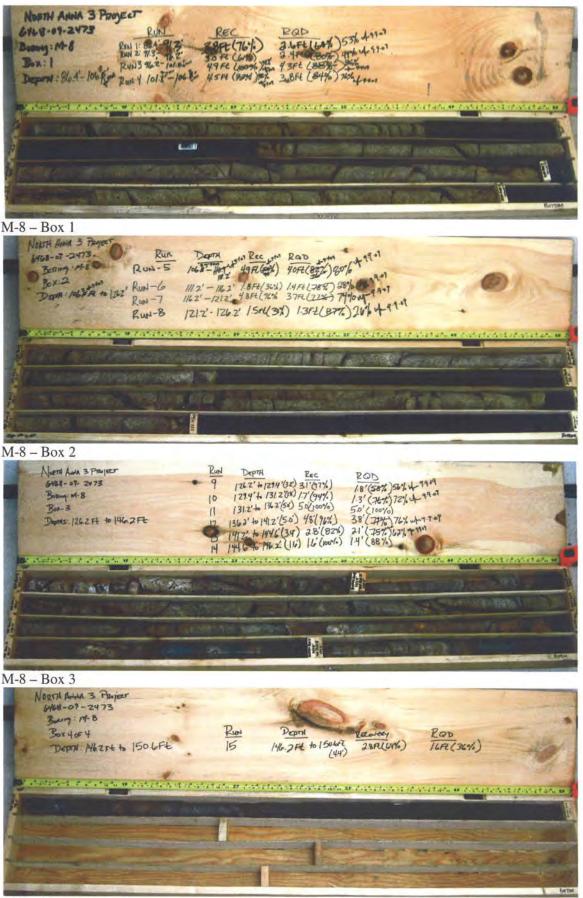
ECHI	TEL PRO	JECT	IO.: 25	161		MACTEC PR	OJECT NO .:	6468-	09-2473	C	OUNTY	: L	ouisa, VA	GEOLOGIST:	3 OF 3 B. Mabie	
					rojec	t Supplement				D	RILLER	: D.	. Rhodes/K. Guy		1	EVEL (ft)
	G NO.:					1	IOD: Mud Rol	tary/F	Rock Core	D	RILL M	ACH	HINE: CME-45C	Frack (RAL)	0 HR.	NA
	ND ELEN		0.3 ft	(NAV	D88)	NORTHING:		-		-			11,685,847	US ft (NAD83)		33.0
_	DEPTH					HODS: ASTM		-				-	ROD TYPE: AW			Auto (MEC-
-	STARTE			1		ED: 9/9/09	HOLE DIA .:					-	t CORE SIZE: I			
LEV.	1	-	ow co	1			S PER FOOT	-		AMP.	lines A	L	T		a consta	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20 40		80	16.25	NO.	MOI	OG	SC	DIL AND ROCK D	ESCRIPTIO	N
0.4	1.4		-					-			- WICH	-				
79.7		-	-	-		Continued f	rom previous	page		_		an	- 178.7			1
	-									-		1112		and coring termina	ated at 150.3	
	ļ.												- Boring o	losed by tremie r	nethod with	
-	-	1 8											- cement	bentonite grout.		
	t													water level meas drilling. Borehole		
	E												136.2 fe	et.	was at a uch	AT OF
-	F												F			
	F												F			
1	-															
1	ţ.			8									1			
1	t												C			
-	-												-			
	F I												-			
1	ţ.												F			
1	E I												F			
													2			
	Ē.												-			
1	ŧ.												F			
3													-			
9	t												-			
	+												E			
	F												F			
1	ŧ.												-			
1	t												-			
1	ŧ												-			
-	Ŧ												-			
	‡												-			
3	t												1			
	+												-			
	Ŧ												Ē			
2	‡												E			
1	t	-											-			
	t												E.			
	Ŧ												-			
1	‡												F			
	İ											-	-			
	F												-			
3	Ŧ												F			
	t												2			
	Ŧ												F			
-	Ŧ												F			
	t												2			
	+	-											-			



SHEET 1 OF 1

														1 OF 1	
			NO.: 2510					ECT N	0.: 6	468-09-2473	COUNTY:		GEOLOGIST:	1	
			North An	na 3 Pr	-							0. Rhodes/K.		FLUID LEVE	. ,
	G NO.:									ry/Rock Core			I5C Track (RAL)	0 HR.	NA
	ID ELEV		329.3 ft	<u>`</u>		IORTHIN				US ft (NAD83)			US ft (NAD83	<u>′</u>	33.0
TOTAL	DEPTH	150	.6 ft	SAM	PLE M	ETHODS	: ASTN	/I D 15	86-0	8a; 2488-09a; 2				: 140-lb. Auto (MEC	C-12)
DATE S	STARTE	D: 9	/1/09	COM	PLETE	D: 9/9/0	9	CASIN	IG D	EPTH: 76.0 ft	CORE BAR	REL TYPE: V	Vireline NQ3 Triple	Tube, series 6 bit	
					16.1		OTD	ATA							
	DEPTH	RUN	DRILL RATE	REC.	RQD	SAMP.	REC.	RQD				DESCRIPTIC	N AND REMARKS		
(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	G						
					•							Begin Co	oring @ 86.4 ft		
242.9	86.4	4.9	N=50/0.0 3:35 3:12	(3.8) 78%	(2.6) 53%	RUN 1	(3.8)	(2.6)					e staining, moderately hard, BIOTITE QUA		· · · ·
			3:12 3:26 3:01	1010	0070						nts at 40-50°, o				ş
238.0	91.3	4.9	1:48/0.9	(3.0)	(2.4)	RUN 2	(0.0)	(0.0)	2	WEAT Recover		K: Severely wea	athered BIOTITE QUA	RTZ GNEISS (No	
		1.0	2:28	61%	49%		(19.1)	(15.9)		236.1 HARD	ROCK: Light of	aray, brown, tar	n, and light brown, with	orange staining.	1
233.1	96.2		2:24 2:30/0.9				96%	80%		moder	ately to slightly	weathered, clo	bse fracturing, medium	hard to moderately	
200.1	30.2	5.0	2:36 2:46	(4.9) 98%	(4.3)	RUN 3	1		$\ $	(1 joint	at 60°, open;	3 at 90°, open)			
			2:21 2:39	90%	00%					– (9 joint	s at 20-50°, tig	int)			
228.1	101.2		2:59	14.5	(0.0)	DUNIA				-	+ 00 000 1		int at 0.0° timet		
		5.0	2:30 2:35	(4.5) 90%	(3.8) 76%	RUN 4					s at 20-30°, tig	int to open; 1 jo	pint at 90°, tight)		
			2:13 2:33						\gg	_					
223.1	106.2	5.0	2:41 2:38	(4.9)	(4.0)	RUN 5				(10 joir	nts at 0-40°, op	pen to tight)			
			2:46 2:15	98%	80%					-					
218.1	111.2		2:26							-					
210.1	1111	5.0	2:37 2:18	(1.8) 36%	(1.4) 28%	RUN 6	1			(3 joint	s at 0-40°, ope	en)			
			1:50 2:12	50%	2070		(0.0) 0%	(0.0) 0%	2	WEAT		K: Severely wea	athered BIOTITE QUA	RTZ GNEISS (No	
213.1	116.2	5.0	2:35	(4.8)	(3.7)	RUN 7	(6.3)	(5.0)		213.1		prown to tan an	d gray, with orange st	aining moderately to	1
		0.0	1:53	96%	74%		97%	77%	\gg		weathered, cl		moderately hard, BIO		
208.1	121.2		2:22 2:50								al joints at 90°,	open)			
200.1	121.2	5.0	2:32 2:29	(1.5)	(1.3)	RUN 8				F 200.0	at 20°, open)				1
			2:36	30%	26%		(0.0)	(0.0)	2	- WEAT - Recov		K: Severely wea	athered BIOTITE QUA	RTZ GNEISS (No	
203.1	126.2		4:17		(1.0)	DUNO				203.1	.,				1
		3.2	3:40 4:01	(3.1) 97%	(1.8) 56%	RUN 9	(21.8) 89%	70%	'\$\$	moder	ately severe to	moderately we	d light gray, with orang eathered, close fractur		
199.9	129.4	1.8	3:01	(1.7)	(1.3)	RUN 10	1				BIOTITE QUAR nts at 0-90°, or		n from 126.2-127.8 ft)		
198.1	131.2	5.0	2:08/0.8	94%	72%	RUN 11				- (4 ioint	s at 0-30°, tigh	nt to open) ght; 3 joints at 8			
			2:51 2:46 2:33	100%	100%					-	- at 20.00 , by	, o jointo at t	,		
193.1	136.2		2:49 2:55							Ł					
		5.0	3:01 2:44	(4.8) 96%	(3.8) 76%	RUN 12				(6 joini	s at 20-30°, op	pen; 2 joints at	80-90°, open)		
			2:39 3:03						$\ $	-					
188.1	141.2	3.4	3:26 2:43	(2.8)	(2.1)	RUN 13	-		$\langle \rangle \rangle$	(2 joint	s at 0-20°, ope	en; 2 joints at 8	0°, open)		
104 7	444.0		2:46 2:33	82%	62%					F					
184.7 183.1	144.6 146.2	1.6	1:28/0.4 2:02/0.6	(1.6)	(1.4)	RUN 14	1			- (4 joint	s at 20-40°, tig	ght to open)			
		4.4	2:13	(2.8)	88%	RUN 15	1			(7 joint	s at 20-60°, o	oen)			
			2:54 3:26	64%	36%				$\ $						
178.7	150.6		4:12 1:33/0.4	/					1>>>	<u>178.7</u> Boring	and coring ter	minated at 150	.3 feet.		
										- Boring	closed by trer	nie method with	n cement-bentonite gro	out.	
										-			09/2009 prior to drilling		
											of 136.2 feet.	neasured on 3/		g. Doronoio was at a	
										-					
										-					

Core Photographs Boring M-8 North Anna 3 Project MACTEC Project No. 6468-09-2473



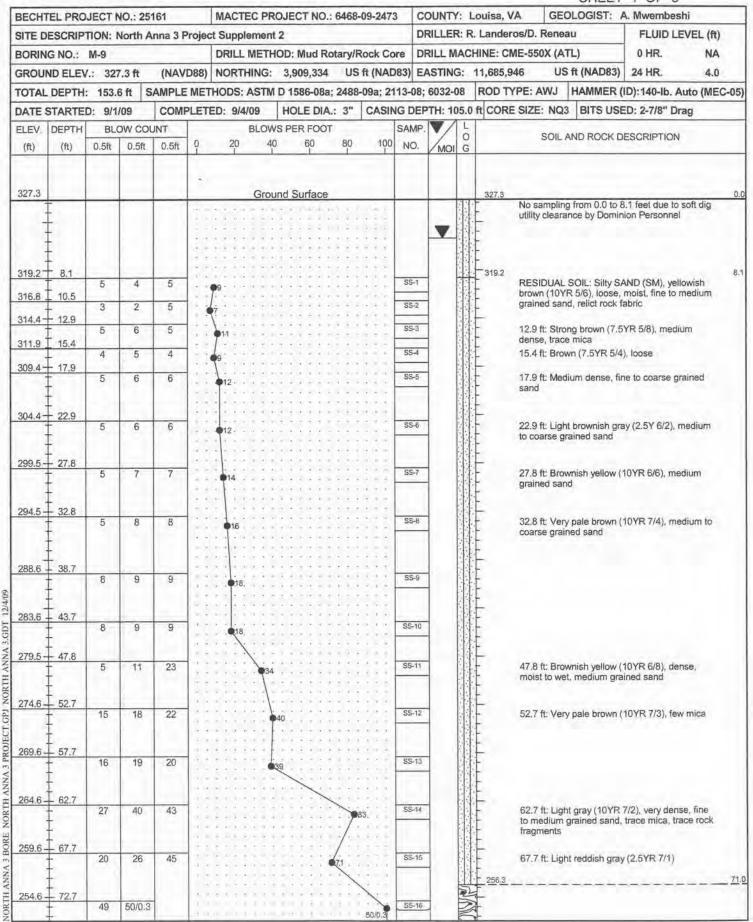
M-8 - Box 4



Prepared By JJJ Date 12/16/09

Checked By MML Date 12/14/19





Volume 1, Revision 0



-														SHEET	2 OF 3	
BECHT	TEL PRO	JECT	NO.: 25	161	IV	ACTEC PR	ROJECT NO .:	6468-	09-247	3 C	OUNT	/: L	ouisa, VA GE	OLOGIST: /	A. Mwembesh	i
SITE D	ESCRIP	TION:	North A	nna 3 F	Project S	Supplemen	t 2			D	RILLER	R: R	Landeros/D. Rene	au	FLUID LEV	/EL (ft)
BORIN	G NO.:	M-9			D	RILL METH	HOD: Mud Rot	ary/F	Rock Co	ore D	RILL M	ACI	HINE: CME-550X (A	TL)	0 HR.	NA
GROUI	ND ELE	V.: 32	7.3 ft	(NAV	D88) N	IORTHING:	3,909,334	US	ft (NAD	083) E	ASTIN	G:	11,685,946 US	6 ft (NAD83)	24 HR.	4.0
TOTAL	DEPTH	: 153.	6 ft S	AMPLE	METHO	DDS: ASTN	I D 1586-08a;	2488	-09a; 21	113-08	6032-0	08	ROD TYPE: AWJ	HAMMER (ID):140-Ib. Au	to (MEC-
DATE	STARTE	D: 9/1	/09	COM	PLETED	: 9/4/09	HOLE DIA .:	3"	CASIN	IG DE	PTH: 10	05.0	ft CORE SIZE: NQ	BITS USE	ED: 2-7/8" Dra	g
ELEV.	DEPTH	BL	OW CO	UNT		BLOW	VS PER FOOT			SAMP	. V/	L				
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20 4	0 60	80	100	NO.	MOI	O G	SOIL	AND ROCK D	ESCRIPTION	
						0 11 11										
252.5	-					Continued	from previous	page	· · ·			52	- WEATHER	ED ROCK: Se	everely weather	ed
- 249.6 -	77.7											5	F BIOTITE Q	UARTZ GNER	SS (Sampled as own (10YR 8/3 8	Silty
		39	50/0.4	1	1.1.1				50/0.4	SS-17	-	5	10YR 7/3),	very dense, m	oist, medium gr ttle rock fragme	ained
-	L												(continued)		we rock hagme	nts)
244.6 -	82.7	50/0.4			1.1.1			· · ·	::L	SS-18		2	 L			
-	F	50/0.4							50/0.4	0010			-			
-	F				1 : : :				::			2				
239.6 -	87.7	50/0.4	1						50/0.4	SS-19			F			
-	ţ.											2				
-	92.7												-			
		50/0.4	1			 			50/0.4	SS-20	7	2				
-	L							 					-			
229.6-	97.7	50/0.0			1.1.1					SS-21		2	-			
	F	50/0.2			1:::				50/ <u>0</u> .2	00-21	1	R				
	ŧ.				1							2	-			
- 223.2	104.1											K	-			
	- 104.1	50/0.1						· · ·	50/0.1	SS-22	7	2	ţ			
2195-	- 107.8								::			R				
	107.0	50/0.2	1						50/0.2	SS-23	7		107.8 ft: Gr	ayish brown (1	10YR 5/2)	
	F				1.1.1				::			R				
214.5 -	112.8				1111				::							
	ŧ	50/0.2						• • •	50/0.2	SS-24	1	5	F 112.8 ft: Pa	le yellow (2.5)	YR 7/4)	
	‡											3	-			
209.4-	- 117.9	35	50/0.4	-						SS-25	-	5	- 117 9 ft· Br	own (10YR 5/3	3)	
	t	0.00	00/0.4						50/0.4		1	5	a_ 		-	
205.4	121.9	50/0.0	-						E O IO	SS-26	-	R	205.4 121.9 ft: Bit		refusal with no	/ 1
	F	50/0.0			1.1.1				50/0.0	33-20		\gg	HARD ROO	CK: Light to da	irk gray, slightly	/
	Ŧ												fracturing, i	to fresh, very o medium hard t	o hard, BIOTITE	E
_	‡											\gg	F QUARTZ G	SNEISS		
	‡															
	ţ															
	ŧ											\otimes	<u></u>			
	t															
	t															
	t												1			
	Ŧ												1			
	Ŧ												Į.			
	‡				1											
	t				1		 		•••				1			
-	t							к к ж 1								
	Į												1			





BECH	TEL PRO	JECT	NO.:	25161		MACTEC PR	OJECT NO .:	6468	-09-2473	0	OUNTY	1: L	ouisa, VA GEOLOGIST: A	3 OF 3 A. Mwembeshi	-
					Proie	ct Supplement				-			Landeros/D. Reneau	FLUID LEVE	L (ft)
_	G NO.:			, and J		DRILL METH		tary/	Rock Cor	-			HINE: CME-550X (ATL)	0 HR.	NA
	ND ELE		734	(MA)	/080	NORTHING:		-		-		-	11,685,946 US ft (NAD83)		4.0
	DEPTH					THODS: ASTM		_		_		-		D):140-lb. Auto	
			-				1	_	1	_	_	-		D: 2-7/8" Drag	(INEC-
_	STARTE	1			PLEI	ED: 9/4/09	HOLE DIA .:	3		SAMP	1	15.0	IL CORE SIZE. NUS DITS USE	D: 2-116 Drag	
LEV.	DEPTH	0.5ft	0.5	OUNT	0	20 40		80	100	NO.	11	0	SOIL AND ROCK D	ESCRIPTION	
(ft)	(ft)	0.51	0.5	11 0.011	+ī	î	T	1	1.	NO.	MOI	G			
77.7						Continued f	rom previous	page	9						
	1	-	1		1			111	+ + + + + + + + + + + + + + + + + + +						
-	t				13.3		*****	111	1.1.1				173.7		1
	-												 Boring and coring termina 	ted at 153.6 feet.	
-	Ŧ												 Boring closed by tremie m 	ethod with	
-	t l												cement-bentonite grout.		
	t												- 24 hour water level measu		
	t												prior to drilling. Borehole 121.9 feet.	was at a depth of	
1	F														
	t.														
	t												-		
	+												-		
	‡														
	t												-		
	÷												-		
	‡														
	‡												-		
	t		6									13			
	Ŧ												-		
-	1														
	t														
	ł														
	‡.														
	t														
	t		1												
	F		1		1								-		
	‡												-		
	t												_		
			1										_		
	Ŧ											13	-		
	t				1										
	+												-		
	Ŧ												F		
	1												-		
	t														
	+												-		
	Ţ												-		
	t														
	Ŧ														
	1												-		
-	+	1													
	Ŧ												-		
	t														
	+												-		
	+							_					E		



		IFOT	10.000	-4		ACTEC	DDO IS	OTN	0.0	460 00 0470	COUNTY: Louise VA	GEOLOGIST: A	1 OF 1	
			NO.: 2516					CIN	0.: 6	468-09-2473	COUNTY: Louisa, VA			1 (64)
			North An	na 3 Pr	-				Det	m/Deck Com	DRILLER: R. Landeros/D.			
	G NO.:			()) () ()						ry/Rock Core	DRILL MACHINE: CME-55		0 HR.	NA
	ID ELEV		327.3 ft	<u>`</u>		IORTHIN					EASTING: 11,685,946	US ft (NAD83)	24 HR.	4.0
	DEPTH:										113-08; 6032-08		140-lb. Auto (MEC	C-05
DATE S	TARTE	D: 9	/1/09	COM	PLETE	D: 9/4/0	9	CASIN	IG D	EPTH: 105.0 ft	CORE BARREL TYPE: Wi	reline NQ3 Triple T	ube, series 6 bit	
					INT		CTD	ATA	1.					
	DEPTH	RUN	DRILL RATE	REC. (ft) %	RQD	SAMP. NO.	STR REC.	RQD			DESCRIPTION	AND REMARKS		
(ft)	(ft)	(ft)	(Min/ft)	%	(ft) %	NO.	(ft) %	(ft) %	G					
					`						Begin Cori	ng @ 98.6 ft		
228.7	98.6	4.8	0:39 0:47 0:33 0:39	(0.0) 0%	(0.0) 0%	RUN 1	(0.0) 0%	(0.0) 0%	ANN?	- (Samp	HERED ROCK: Severely weath led as Silty SAND (SM), very pa moist, medium grained sand, t ued)	ale brown (10YR 8/3 8	& 10YR 7/3), very	
223.9	103.4		0:37 N=50/0.1			SS-22			5	 (No Co refusal 	pre Recovery - cont. boring with	mud rotary and SPT	sampling to bit	
			N=50/0.1			33-22			5	-				
			N=50/0.2			SS-23			5	- 107.84	ft: Grayish brown (10YR 5/2)			
			N=00/0.2			55-25			5	-	(10 TR 5/2)			
									5	-				
			N=50/0.2			SS-24			5	- 112.81	ft: Pale yellow (2.5YR 7/4)			
										-				
									S	-				
			N=50/0.4			SS-25				- 117.91	ft: Brown (10YR 5/3)			
									2	- 205.4 121.91	ft: Bit Refusal; SPT refusal with	no penetration		
205.4	121.9 123.6/		N=50/0.0 3:09	(1.2)	(0.0)	RUN 2	(31.2) 98%	(28.4) 90%		HARD	ROCK: Light to dark gray, sligh ing, medium hard to hard, BIOT	tiy weathered to fresh	n, very close to wide S	
		5.0	1:41/0.7	(5.0)	(4.6)	RUN 3				(2 joint	ts at 30°, tight)			
			1:52 3:28 3:01	100%	92%				\otimes		ts at 45°, tight)			
198.7	128.6	5.0	4:23	(5.0)	(5.0)	RUN 4	-			– (3 joint	ts at 90°, open; several mechan	ical fractures)		
			8:34 5:43	100%	100%					-	X			
193.7	133.6		5:57 12:12					2						
100.7	100.0	5.0	1:17 1:47	(5.0) 100%	(4.2) 84%	RUN 5	1			(3 joint	ts at 30°, open with trace clay; 1	joint at 45°)		
			2:02	100%	0470				\otimes	F				
188.7	138.6		1:46	(5.0)	(5.0)	DUNG	-				at 20° tight with trace evenes	ataining)		
		5.0	1:51	(5.0) 100%	(5.0) 100%	RUN 6			$\langle \rangle \rangle$		t at 30°, tight with trace orange	staining)		
			2:04 2:47							-				
183.7	143.6	5.0	4:29 2:45	(5.0)	(4.7)	RUN 8	1			– (3 join	ts at 15°, tight with trace brown-	orange staining)		
			4:05 2:43	100%	94%									
178.7	148.6		2:12 3:08							-				
	, 10.0	5.0	1:43 2:11	(5.0) 100%	(4.9) 98%	RUN 9]			(2 joint	ts at 45°, tight; several mechani ar, calcite, and muscovite from	cal fractures; quartz v 151.6 to 153.6 feet)	ein with trace	
			2:09	100 %	30 %							1010101000		
173.7	153.6		2:54						111	_ 173.7 Borino	and coring terminated at 153.6	feet		
										-			.+	
										-	closed by tremie method with			
											ur water level measured on 9/04 of 121.9 feet.	2009 prior to drilling.	Borehole was at a	
										-				
										-				
										-				
										-				
										-				
								1		-				





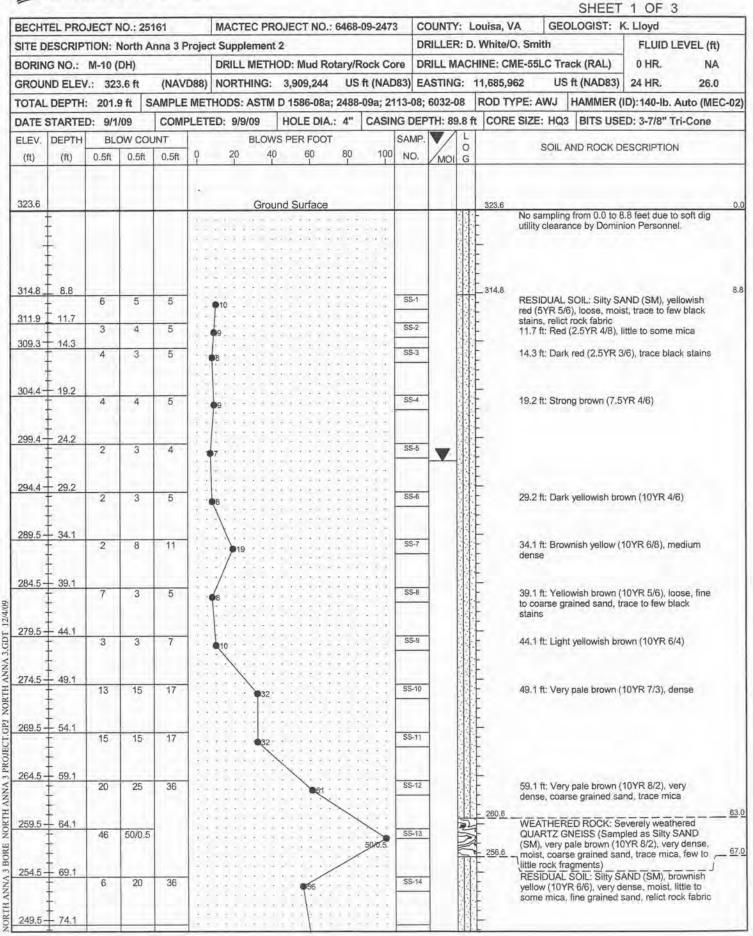


M-9 – Box 2



Prepared By JJJ Date 12/16/09

Checked By MgL Date 12/16/09



Volume 1, Revision 0



															SHEET	2 OF 3	3	
BECH	TEL PRO	JECT I	NO.: 25	161	M	ACTEC PR	ROJECT NO.	: 6468	-09-2473	С	OUNTY	/: L	ouisa, VA	GEC	LOGIST: I	K. Lloyd		
SITE D	ESCRIP	TION:	North A	nna 3 P	roject S	upplemen	t 2			D	RILLEF	R: D.	. White/O. Smit	th		FLUID L	EVEL (f	t)
BORIN	IG NO.:	M-10 (DH)		DF	RILL METH	HOD: Mud R	otary/F	Rock Co	re D	RILL M	AC	HINE: CME-55L	.C Tra	ack (RAL)	0 HR.	N	Ą
	ND ELE			(NAV			3,909,244				ASTINO	G:	11,685,962	US	ft (NAD83)	24 HR.	26.	0
	DEPTH						1 D 1586-08a		-09a; 21	13-08:	6032-0	08	ROD TYPE: A	WJ	HAMMER	(ID):140-Ib. /	Auto (MI	EC-
DATE	STARTE	D: 9/1	/09	COMF	LETED:	9/9/09	HOLE DIA	.: 4"	CASIN	G DE	PTH: 89	9.8 f	t CORE SIZE:	HQ3		ED: 3-7/8" T		
	DEPTH		DW CO				VS PER FOO			SAMP		L						
(ft)	(ft)	0.5ft	0.5ft	0.5ft	ò	20 4		80	100	NO.	MOI	0 G		SOIL A	AND ROCK D	ESCRIPTION	N	
()																		
248.8		4.4	47	40	C	ontinued	from previou	s page	e	SS-15		1.1.1	7446	t Von	dod, bluich e	aray (10BG 3/	1) fino	
	‡	14	17	43						33-10	1		to coa	irse gr	ained sand, li	ttle mica, trac	r), inte æ	
244.5 -	- 79.1												- weath - RESI	ered r	ock fragment SOIL: Silty S/	s AND (SM), br	ownish	
	1	14	24	35			59		[SS-16						ense, moist, l sand, relict ro		
	t												- (contin	nued)	pale brown (
239.5-	- 84.1	07	44	40						SS-17	-		-					
	÷	27	41	49					90 .	55-17	-		- 237.6 _ weath	ered r	ock fragment	10YR 7/4), fe s		_
	Ŧ.								:\:			5	WEA BIOTI	THER	ED ROCK: Se	everely weath SS (Sampled	ered as Siltv	
234.5-	- 89.1	50	50/0.2							SS-18			SAND	(SM)	, very pale bro	own (10YR 7/ noist, fine to c	4 and	
	ŧ								100/0.7			5	graine	ed san	d, little mica,	little rock frag	ments)	
-	£											5						
	t											5						
	F											5	-					
_	Ŧ											5	-					
	‡											5	-					
221.5	- 102.1	50/0.5	-							SS-19		5	-					
-	ŧ								50/0.5			5	-					
217.3	106.3	50/0.0								SS-20			-					
2	t	50/0.2							50/0.2	00-20	1	5						
	+												212.8					
212.3	<u>+ 111.3</u>	50/0.0							50/0.0	SS-21	-		L HARD			vith orange st derately weat		
_	ŧ												- close	fractu	ring, medium	hard to mode		
	ŧ											\otimes	207.3 hard,	BIOTI	TE QUARTZ	GNEISS		
	‡									RS-1						wish brown w ely to slightly	rith	
	ŧ												weath	ered.	close to mode		OTITE	
	t											\otimes	QUAF	RTZ G	NEISS	ra to nara, Bi	OTTE	
	t																	
	F											\gg						
1	Ŧ											\$	F					
-	‡												1					
	ŧ.												<u>}</u>					
	ŧ																	
-	ŧ									RS-2								
	±																	
	t											V//						
-	F												1					
	Ŧ												Ŧ					
-	‡												170.0					
	‡												178.8 HARI	D ROC	K: Light gray	to gray, sligh	tly	1
	t												weath	nered t	o fresh, close	to wide fract	uring,	
-	+												-					

Volume 1, Revision 0





SHEET 3 OF 3

BECHT	TEL PRO	JECT	NO. · 2	5161		MA	CTEC P	ROJ	ECT NO.	6468	09-247	3 0	OUNT	Y: 1	ouisa, V	A G	OLOGIST:	K. Llovd		
	ESCRIP				Proie										White/C			FLUID L	EVEL (#))
	IG NO.:				Toje	-			: Mud Re	otary/E	Pock Co						rack (RAL)	0 HR.	NA	
	ND ELE			(114)	(000)				909,244						11,685,9		IS ft (NAD83)	-	26.0	
						_										PE: AWJ		(ID):140-Ib. /		
	DEPTH							_	1586-08a										and the second se	-
	STARTE				PLEI	ED:	9/9/09		OLE DIA		CASIN		I manager (9.8 n	CORE	SIZE: HO	A3 BITS US	ED: 3-7/8" Tr	ri-Cone	
					0			40 40	ER FOOT 60	80	100	SAMP		0		SOIL	AND ROCK D	ESCRIPTION	l.	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	Ĭ		ī	1	Î		100	NO.	MOI	G						_
174.0						Co	ntinuec	from	previou	s page	9									
-	+				1.1		 								-		CK: Light gray to fresh, close			
	‡				1 : :					· · ·					F	hard to ve	ry hard, BIOTI1	E QUARTZ G	NEISS	
-	±.					• •		• • •		• • •		RS-3			-	(continued	1)			
-	+														t					
	Ŧ				1										-					
-	ţ					• • •		• • •							F					
-	t														t					
	Ŧ				1::	· · ·								\otimes	ł					
	‡					• • •		• • •							F					
	t													$\ $	ŀ					
	f				1.										-					
	ţ							**							F					
	t														t					
	f														ŀ					
-	ŧ				:									V//	F					
	t														t					
	t											RS-4			L					
	Ŧ.				1::						× × ×				F					
	t																			
	+				1										-					
	Ŧ				1::			•••			 				F					
	t							• •			$\mathbf{x} = \mathbf{x}$									
	+				1.										1					
	Ŧ				1::									\otimes	F					
	t							• •			$x \propto x$				ł					
	t				1:1										L					
-	Ŧ				1:			 						\otimes	1					
	‡				1 .			•••							+					
	t											RS-5		$\ $	124.7					
	Ŧ				1	 		· · · ·							-	HARD RC	CK: Dark gray	, very slightly		-
	<u>t</u>													V]]]	121.7	weathered fracturing	, close to mod very hard, QU	erately close ARTZ BIOTITI	E _	
-	±														-	GNEISS				
	ŧ														E		d coring termin		eet.	
	ŧ														- -	cement-be	entonite grout.	nethod with		
	Ť														-	24 hour w prior to dr 196.6 feet	ater level meas illing. Borehole	sured on 9/09/2 was at a dept	2009 th of	
-	+														-					
	Ŧ														E					
	Ŧ														E					
	Ŧ														F					
	‡														-					
	+														F					



SHEET 1 OF 2

BECHTEL PROJECT NO.: 25161	MACTEC PROJECT NO.: 6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST:	K. Lloyd	
SITE DESCRIPTION: North Anna 3 Pro	ect Supplement 2	DRILLER: D. White/O. Smit	h	FLUID LE	VEL (ft)
BORING NO .: M-10 (DH)	DRILL METHOD: Mud Rotary/Rock Core	DRILL MACHINE: CME-55L	C Track (RAL)	0 HR.	NA
GROUND ELEV .: 323.6 ft (NAVD	8) NORTHING: 3,909,244 US ft (NAD83	EASTING: 11,685,962	US ft (NAD83)	24 HR.	26.0
TOTAL DEPTH: 201.9 ft SAMP	E METHODS: ASTM D 1586-08a; 2488-09a; 2	2113-08; 6032-08	HAMMER (ID):	140-lb. Auto (M	/IEC-02)
DATE STARTED: 9/1/09 COMP	ETED: 9/9/09 CASING DEPTH: 89.8 ft	CORE BARREL TYPE: Wire	line HQ3 Triple	Tube, series 6 a	& 10 bits

ELEV.	DEPTH	RUN	DRILL		JN	SAMP.		ATA	L	
(ft)	(ft)	(ft)	RATE (Min/ft)	REC. (ft) %	RQD (ft) %	NO.	REC. (ft) %	RQD (ft) %	O G	DESCRIPTION AND REMARKS
										Begin Coring @ 89.8 ft
233.8 231.8	89.8 91.8	2.0 5.0	1:37 1:15 0:41 0:32 0:39 0:45	(0.0) 0% (0.0) 0%	(0.0) 0% (0.0) 0%	RUN 1 RUN 2	(0.0) 0%	(0.0) 0%		WEATHERED ROCK: Severely weathered BIOTITE QUARTZ GNEISS (Sampled as Silty SAND (SM), very pale brown (10YR 7/4 and 10YR 7/3), very dense, moist, fine to coarse grained sand, little mica, little rock fragments) (continued) (No Recovery) (No Recovery)
226.8	96.8	5.0	0:46 1:15 0:32 0:27 1:07 1:00	(0.0) 0%	(0.0) 0%	RUN 3			NUS ANG	(No Recovery)
221.8 221.0	101.8	3.7	N=50/0.5 1:17 0:33 0:42	(0.0) 0%	(0.0) 0%	SS-19 RUN 4			ANVA.	(No Recovery)
<u>217.3</u> 217.1	106.3 106.5	4.8	0:41/0.7 N=50/0.2 0:42 0:45 0:39	(0.5) 10%	(0.0) 0%	SS-20 RUN 5				
212.3		5.0	0:42 0:45/0.8 N=50/0.0 1:37 1:05 1:14 1:38	(5.0) 100%	(3.3) 66%	RUN 6	(5.5) 100%	(3.3) 60%		212.8 111 HARD ROCK: Light tan with orange staining, moderately severe to moderately weathered, close fracturing, medium hard to moderately hard, BIOTITE QUARTZ GNEISS (2 joints at 30°) 207.3 (4 joints at 20-30°, open with orange staining; 2 joints at 60-70°, open with 11
207.3		5.0	1:30 1:31 1:21 1:51 1:42 1:25 1:56	(4.5) 90%	(3.6) 72%	RUN 7 RS-1	(27.6) 97%	(22.0) 77%		brown-orange staining) HARD ROCK: Light yellowish brown with orange staining, moderately to slightly weathered, close to moderately close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS
		5.0	2:07 2:09 2:21 2:39 2:24	(4.8) 96%	(4.0) 80%	RUN 8	-			 (4 joints at 30°, open with trace clay and orange staining) (4 joints at 30°, open with orange stain; 2 joints at 60-70°, open with trace clay)
197.3		5.0	2:48 2:33 2:17 2:12	(5.0) 100%	(4.1) 82%	RUN 9	-			(3 joints at 20-30°, open with trace clay; 2 joints at 45°, open with trace clay)
192.3		5.0	2:31 2:14 2:49 3:15 2:36 2:45	(5.0) 100%	(4.2) 84%	RUN 10 <i>RS-2</i>	-			(3 joints at 30°, tight)
187.3		5.0	2:06 2:25 2:20 2:18	(5.0) 100%	(4.1) 82%	RUN 11	-			(2 joints at 30°)
182.3		3.5	2:39 2:18 2:40 2:05	(3.3) 94%	(2.0) 57%	RUN 12	-			(4 joints at 30°)
177.0		1.8 5.0	3:04/0.5 1:34 3:05/0.8 3:28 4:31 3:38 2:15	(1.8) 100% (5.0) 100%	(1.8) 100% (3.2) 64%	RUN 13 RUN 14	(53.0) - 98%	(50.5) 93%		 HARD ROCK: Light gray to gray, slightly weathered to fresh, close to wide fracturing, hard to very hard, BIOTITE QUARTZ GNEISS (2 joints at 20°, tight with trace orange staining) (4 joints at 30°, tight)
172.0		5.0	2:06 4:20 4:58 5:05 5:50	(5.0) 100%	(4.7) 94%	RUN 15 RS-3	-			(3 joints at 0-10°, tight; 1 joint at 60°, tight)
167.0		5.0	3:49 5:20 6:36 5:28 6:02	(5.0) 100%	(5.0) 100%	RUN 16	-			(fractures are mechanical)
162.0	161.6	5.0	4:58 4:03 5:32 4:47	(4.7) 94%	(4.5) 90%	RUN 17	-			(4 joints at 30°, tight)

Volume 1, Revision 0



BECHTEL PROJECT NO.: 2516	1	MACTEC PRO	JECT NO .:	6468-09-2473	COUNTY:	Louisa, VA	GEOLOGIST:	<. Lloyd	
SITE DESCRIPTION: North Ann	na 3 Projec	t Supplement 2			DRILLER:	D. White/O. Smi	th	FLUID L	EVEL (ft)
BORING NO .: M-10 (DH)		DRILL METHO	D: Mud Rot	ary/Rock Core	DRILL MA	CHINE: CME-55L	C Track (RAL)	0 HR.	NA
GROUND ELEV .: 323.6 ft	(NAVD88)	NORTHING:	3,909,244	US ft (NAD83)	EASTING:	11,685,962	US ft (NAD83)	24 HR.	26.0
TOTAL DEPTH: 201.9 ft	SAMPLE	METHODS: AST	FM D 1586-0)8a; 2488-09a; 2	113-08; 603	32-08	HAMMER (ID):	140-lb. Auto ((MEC-02)
DATE STARTED: 9/1/09	COMPLE	TED: 9/9/09	CASING D	DEPTH: 89.8 ft	CORE BA	RREL TYPE: Wir	eline HQ3 Triple	Tube, series 6	& 10 bits

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	JN RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RQD (ft) %	L O G	DESCRIPTION AND REMARKS	
					•					Continued from previous page	
157.0	166.6	5.0	3:58 3:18 4:32 6:20 7:15	(5.0) 100%	(5.0) 100%	RUN 18				HARD ROCK: Light gray to gray, slightly weathered to fresh, close to wide fracturing, hard to very hard, BIOTITE QUARTZ GNEISS (continued) (1 joint at 30°, open with trace clay)	
152.0	171.6	5.0	11:34 10:45 3:38 4:45 6:08	(5.0) 100%	(5.0) 100%	RUN 19				(2 joints at 10-20°, tight with trace orange stain)	
147.0	176.6	5.0	10:32 8:02 4:21 6:05 5:52	(5.0) 100%	(4.8) 96%	RUN 20 RS-4				(3 joints at 10-20°, tight to open with trace clay and orange stain)	
142.0	181.6	5.0	8:42 10:45 4:02 6:42 3:16	(4.7) 94%	(4.7) 94%	RUN 21				(2 joints at 10-20°, tight)	
137.0	186.6	5.0	3:29 2:40 3:15 3:45 4:17	(5.0) 100%	(5.0) 100%	RUN 22				(No joints)	
132.0	191.6	5.0	4:12 4:17 4:56 5:43 4:54	(4.8) 96%	(4.8) 96%	RUN 23				(No joints)	
<u>127.0</u> 124.7		2.3	5:17 4:18 3:16 3:10 3:25/0.3	(2.0) 87%	(2.0) 87%	RUN 24 <i>RS-5</i>				(No joints) - 124.7	1
121.7	201.9	3.0	3:37 3:37 2:52	(3.0) 100%	(2.8) 93%	RUN 25	(3.0) 100%	(2.8) 93%		HARD ROCK: Dark gray, very slightly weathered, close to moderately close fracturing, very hard, QUARTZ BIOTITE GNEISS (2 joints at 20-30°, tight) Boring and coring terminated at 201.9 feet.	2
										Boring closed by tremie method with cement-bentonite grout. 24 hour water level measured on 9/09/2009 prior to drilling. Borehole was at a	
										epth of 196.6 feet.	
		a.								-	

Core Photographs Boring M-10(DH)

North Anna 3 Project MACTEC Project No. 6468-09-2473



M-10(DH) - Box 4

Core Photographs North Anna 3 Project Boring M-10(DH) MACTEC Project No. 6468-09-2473 North Anno 3 Proyect RaD REC Run (165-07 2173 Beany M-10 (DH) Bar 5-87 Darts: 156.6-1716 5.0' 4.9 (1007.) Run 16 (156.6-1666) Run 17 (1666-1666) Run 18 (1666-1716) 5.0', (1007) 4.7, (94 %) 5.0 (1007) 4548 41 martine (82% (907.) 47. 5 (1002) M-10(DH) - Box 5 North Anna 3 Project G46 8-09-00-05 M-10(DH) Box 6-17 Box 6-17 REC Nun KQD Run 19 (1716-1766) 50 46 (18 2) (1002) 50 46 37 (747.) (1602) 50 46 (187.) (1002) 50' (100 %) Run 20 (1766-186) Run 21 (1816- 186.6 5.0 (100 %) Depth (1716 1866 50' (100%) enternet d'un enternet a sector de la sector d Longitudiate at 1 10 C 14 14 M-10(DH) - Box 6 North Anna 3 Project 6468-09-2473 M-10(14) Dox 7-77 REC Run RAD Run 22 (186.6-191.6) (10%) 50 (100% 4.5 (76 %) 2.0' (1672) 2.8' (152) Run 23 Derth (186.6-2019) 4.8 (96%) (1916 1965 Run 24 20' (872) 30' (1007.) (196 1989) 2.0' (198.9'- 2019') Run as at states of a factor enter of all all and an elistic terms A 18 - 19 48. 6-5-6 etiatu w

M-10(DH) - Box 7

ALLAS TE HAS



Date 12/16/09 Prepared By JJJ

Date 12/16/09 Checked By MML

	EL PRU	JECT	NO.: 25	161		MACTEC PR	OJECT NO .:	6468-	09-2473		COUNTY	/: L	Louisa, VA GEO	LOGIST: C	. Baldwin	
SITE DI	ESCRIP	TION:	North A	nna 3 P	rojec	t Supplement	2			1	RILLEF	R: P.	. Pitts/J. Tucker		FLUID LEVEL	. (ft)
BORIN	G NO.:	M-11				DRILL METH	IOD: Mud Ro	otary		1	RILL M	ACI	HINE: CME-55 Traile	r (RAL)	0 HR.	ND
GROUN	ND ELE	V.: 325	5.9 ft	(NAV	D88)	NORTHING:	3,909,352	US	ft (NAD	83) E	ASTING	G:	11,686,039 US	ft (NAD83)	24 HR.	ND
TOTAL	DEPTH	: 148.	7 ft S	AMPLE	MET	HODS: ASTM	D 1586-08a	2488-	09a; 21	13-08	; 6032-0	08	ROD TYPE: AWJ	HAMMER (I	ID):140-Ib. Auto (MEC-4
DATE S	STARTE	D: 9/1	/09	COMP	PLETE	ED: 9/4/09	HOLE DIA.	: 3"	CASIN	G DE	PTH: 8.	4 ft	CORE SIZE: NA	BITS USE	D: 2-7/8" Tri-Cor	ne
ELEV.	DEPTH	BLO	ow col	UNT		BLOW	S PER FOOT			SAM		L	501 4		ESCRIPTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20 40	60	80	100	NO.	MOI		SULLA	ND ROCK DI	ESCRIPTION	
325.9					*	Grou	Ind Surface						325.9			
	-	-		-	-	GIOL	Ind Surface			-		11	No sampling	from 0.0 to 8	.4 feet due to soft d	lig
1					**			* * *	1.0.4				utility clearar	ice by Domin	ion Personnel.	
1	E I				1.1				***				· - 			
-			-		1.5				41.21.4 4.11.4				-			
317.5	- 8.4		-	6						SS-1			- 317.5		ND (SM), reddish	
315.0	10.9	4	5	6	1.1	9 11		+ + +	111		-		+ yellow (7.5Y)	R 7/6), mediu	m dense, moist, fin	8
-	- 13.4	4	5	5		•10				SS-2			fabric		little mica, relict roci	ĸ
512.5 -	- 13.4	4	6	5	1.	-11				SS-3			10.9 ft: Loos 13.4 ft: Medi	e um dense		
310.0	15.9	5	6	6						SS-4	-		15.9 ft: Yello	w (10YR 8/6)	, fine to coarse	
307.4	18.5			0	1.	•12 · · · · ·							grained sand			
1	E	4	6	6	1 1	•12	******		1.0.0	SS-5			1			
-	-				1.1				***							
302.0	23.9				122	11:::::		***					1			
-	-	6	8	8	122	• • 16 • • • •			* * * *	SS-6	-		ł			
-	ł.												t			
297.0	28.9	6	11	12					* * *	SS-7	- (E			
-	-	16											-			
292.0	33.9				-	. /							÷			
-		5	6	6		•12····			1	SS-8			33.9 ft: Redo	lish yellow (7.	.5YR 7/6)	
-	-				1.4		*****		* * *				F			
287.0	38.9	4	7	8	1.0		*****	***		SS-9	-		F			
-	-			Ŭ	1.4	• • 15 • • • •		111	* * *	-	-		F			
282.0	43.9				1 (7 (t)		* * * * * * *		* * *				1			
	40.0	6	7	8		• • • • • • •				SS-10						
-	F	-			X (7 7				***				F			
277.3	48.6	8	7	6	11				111	SS-11			48.6.ft. Red	fish yellow (5'	YR 7/6)	
1	-	0		0	0 4 0 4	13.		111			-		-	Tour Jonow (O		
272.3	53.6						* * * * * * *						E.			
-12.0		8	14	13		27			1. 1. 1.	SS-12			-			
-							*****									
267.3	58.6		10	47						SS-13	_		ED C D Mar	nale house to	1000 7/2)	
-		11	13	17	0					33-13	-		58.6 ft: Very	pale brown (*	IUTR //3)	
-	-												t			
262.3	63.6	12	23	25			48			SS-14	-		63.6 ft: Redd	dish yellow (7.	.5YR 6/6), dense	
-	F						/						1			
257.3	68.6						/						F			
-	F	14	21	19	11	111119	40	111	184	SS-1	5		68.6 ft: Pale	yellow (5Y 8/	(3)	
	ŧ.				1.1			1.1.1					F			
	73.6	1	1	1	1											

Volume 1, Revision 0



					_				_	_		_	SHEET 2 OF 3
the second second	EL PRO						ECT NO .:	6468-	09-2473	-		-	Louisa, VA GEOLOGIST: C. Baldwin
SITE D	ESCRIP	TION: N	North A	Anna 3 P	oject Supple	ement 2				-			P. Pitts/J. Tucker FLUID LEVEL (ft)
BORIN	G NO.:	M-11			DRILL	METHOD	D: Mud Ro	-		-		-	CHINE: CME-55 Trailer (RAL) 0 HR. ND
GROUN	ND ELEN	/.: 325	5.9 ft	(NAV	88) NORTH	HING: 3	3,909,352	US	ft (NAD	83) E	ASTING	3:	11,686,039 US ft (NAD83) 24 HR. ND
TOTAL	DEPTH	: 148.7	Tft S	SAMPLE	METHODS:	ASTM D	1586-08a;	2488-	09a; 21	13-08	; 6032-0	8	ROD TYPE: AWJ HAMMER (ID):140-Ib. Auto (MEC
DATE	STARTE	D: 9/1/	/09	COMP	ETED: 9/4/	/09 H	IOLE DIA .:	: 3"	CASIN	G DE	PTH: 8,4	4 ft	t CORE SIZE: NA BITS USED: 2-7/8" Tri-Cone
ELEV.	DEPTH	BLC	ow co	UNT	-	BLOWS I	PER FOOT			SAMF	· V/	LO	SOIL AND ROCK DESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 20	40	60	80	100	NO.	MOI		
251.1					Contin	ued from	n previous	nane					
231.1	_	-	-	-	Contai		in provious	page		-	+ 1	11	73.6 ft: Pale yellow (2.5YR 7/3)
247.3	70.0					:17	*** *		1 - 1				RESIDUAL SOIL: Silty SAND (SM), reddish yellow (7.5YR 7/6), medium dense, moist, fine
241.5	10.0	11	16	20		•36				SS-17			to medium grained sand, little mica, relict rock fabric (continued)
-	-												
242.3 -	83.6		-			1			191				
	-	9	10	19		29	· · · · ·		1	SS-18	-		83.6 ft: Yellow (10YR 8/6), medium dense
	F							4 4 4 4 4 5					F
237.3	88.6	10	11	14		25	* * * * *	* * *	4 - 31	SS-19	-		
3	-					2	*****		1 8 2 9				-
232.3	93.6				******	1.	*****	* * *	* * *				
1	-	15	27	26		1111	53	5 F F 4 - 4		SS-20			93.6 ft: Very pale brown (10YR 7/3), very dense
1	-				*****			1 1 1 1 1 1 1 1	1 4 10 1 4 10				
227.3	98.6	9	21	36		1111	11:11			SS-21			98.6 ft: Light brownish gray (10YR 6/2), some
-	E.	5	21					* * *			- 1		i mica
	103.6							1	111			5	WEATHERED ROCK: Severely weathered
444.0	103.0	37	48	52/0.3					1	SS-22		Z	BIOTITE GNEISS (Sampled as Silty SAND (SM), dark yellowish brown (10YR 4/4), very
-	t								100/0.8			2	dense, fine to medium grained sand, some mica, few to little rock fragments)
217.3	108.6		5010.0							SS-23			
-	-	44	56/0.2						100/0.7	33-23	1	2	108.6 ft: Dark olive gray (5Y 3/2)
-	-						*****						
212.3	113.6	50/0.1						1 1 1	50/0.1	SS-24		2	
-	F				******	****			1 -				4
207.3	118.6					****							
	-	50/0.2				* * * * *			50/0.2	SS-25	1	5	118.6 ft: Light olive brown (2.5Y 5/4)
1	-								1.4			5	
202.3	123.6	50/0.2			*****	* * * 3	*****	1 2 4 3 4 4	50/0 2	SS-26		5	T.
4	-				*****	****	*****	4 4 4 4 4 4				D	
197.3	128.6					****		1 4 4 1 4 4	2.1			5	立
	-	50/0.1						111	50/0.1	SS-27	7	D	A Contraction of the second seco
-	ŧ				*****	****	*****	1.0.0	- + + +			2	4
192.3	133.6	50/0.1	1		*****	* * * 1				\$5-28		R	133.6 ft: No recovery
1	t.	50/0.1	1				* * * * *	1	50/0.1	Const		2	
187 3	130 6	-				****	* * * * *		* *			R	
101.3	138.6	50/0.1							50/0.1	SS-29		2	138.6 ft: No recovery
-					*****			2.3.2	- 1			K	
182.3	143.6										_	2	
	F	100/0.1						- 1 -	100/0.1	L_SS-30	1	15	143.6 ft: No recovery
1	F					(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)			* *			2	Ŧ
177.3	148.6	50/0.1	-	-	1 1	1531	+ -	911	50/0 1	SS-31	-	K	177.2

Volume 1, Revision 0



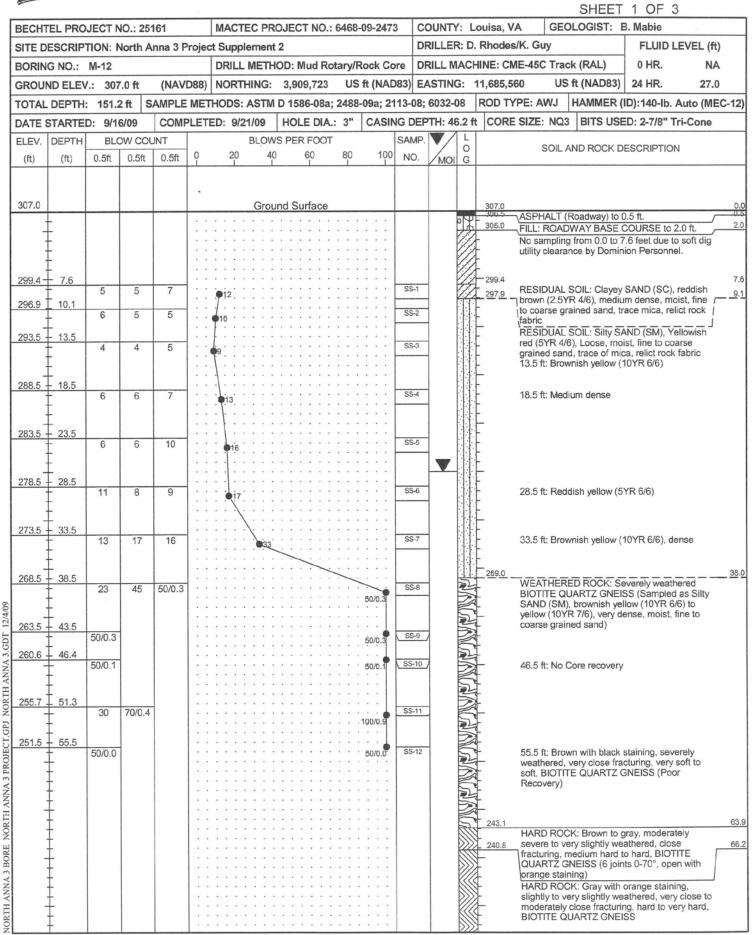


BECHT	EL PRC	JECT N	NO.: 25	161		MACTEC PR	OJECT NO .:	6468	-09-2473	-		-	ouisa, VA GEOLOGIST:	1	
SITE D	ESCRIP	TION: I	North A	nna 3 P	rojec	t Supplement	2			D	RILLER	: P.	Pitts/J. Tucker	FLUID LI	EVEL (ft)
BORIN	G NO.:	M-11				DRILL METH	OD: Mud Ro	tary		D	RILL M	ACH	HINE: CME-55 Trailer (RAL)	0 HR.	ND
GROUN	ND ELEN	V.: 32	5.9 ft	(NAVI	D88)	NORTHING:	3,909,352	US	ft (NAD8	3) E/	ASTING):	11,686,039 US ft (NAD83) 24 HR.	ND
TOTAL	DEPTH	: 148.	7ft S	AMPLE	MET	HODS: ASTM	D 1586-08a;	2488	-09a; 211	3-08;	6032-0	8	ROD TYPE: AWJ HAMMER	(ID):140-Ib. A	uto (MEC-
DATE S	STARTE	D: 9/1	/09	COMP	LETE	ED: 9/4/09	HOLE DIA.	: 3"	CASING	DEF	PTH: 8.4	4 ft	CORE SIZE: NA BITS US	ED: 2-7/8" Tr	i-Cone
ELEV.	DEPTH	BLO	ow cou	JNT			S PER FOOT			AMP.	▼∕	LO	SOIL AND ROCK	DESCRIPTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20 40) 60	80	100	NO.	MOI				
176.3						Continued f	rom previous	page	a						
-	-												148.6 ft: No recovery Boring terminated at 14	3.7 feet.	
-	-												Boring closed by tremie		
-	+												cement-bentonite grout.		
-													Note: Boring terminated	prior to 150 de	pth was
-													 reached after discussion Representative. 	with Bechtel S	ite
-															
-	4														
-													-		
-													-		
-													-		
-	Ľ.												-		
-															
-	F														
4															
-	-												-		
-	-														
-	-														
-	E I														
1	-												-		
	5														
-	-														
-	-														
-	Ē												-		
3													L		
-	-														
-	F														
1	F														
	Ē.														
-	Ē.												-		
-	t l												-		
1	-												-		
-	1												-		
-															
3	F														
1	-												-		
1													-		
1	t												-		
-															
		1													



Prepared By JSJ Date 12/16/09

Checked By MPL Date 12/16/09







			10 5	= 1 0 1				0.1505	0.00	0.00.0	70	001111	V	SHEET 2 OF 3
	TEL PRO							OJECT	10.: 646	8-09-24	73			Louisa, VA GEOLOGIST: B. Mabie
SITE D	DESCRIPT	TION: 1	North	Anna 3 F	rojec								_	D. Rhodes/K. Guy FLUID LEVEL (ft)
BORIN	NG NO.:	M-12				DRIL	L METH	OD: Muc	Rotary	Rock C	ore	DRILL	ACI	CHINE: CME-45C Track (RAL) 0 HR. NA
GROU	IND ELEV	.: 307	7.0 ft	(NAV	D88)	NOR	THING:	3,909,7	23 U	S ft (NA	D83)	EASTIN	G:	11,685,560 US ft (NAD83) 24 HR. 27.0
TOTAL	L DEPTH:	151.	2 ft	SAMPLE	MET	HODS	: ASTM	D 1586-0)8a; 248	8-09a; 2	2113-0	8; 6032-	-08	ROD TYPE: AWJ HAMMER (ID):140-Ib. Auto (MEC
DATE	STARTE	D: 9/1	6/09	COM	PLET	ED: 9/	21/09	HOLE	DIA.: 3'	CAS	ING D	EPTH: 4	6.2 f	2 ft CORE SIZE: NQ3 BITS USED: 2-7/8" Tri-Cone
ELEV.			DW CO					S PER FO			SAN	-	L	L
(ft)	(ft)	0.5ft	0.5ft	0.5ft	Q	20				10	0 NC	. мо	OG	
()	(/										1			
232.2						Con	tinued f	rom prev	ious pa	ge				
	Ŧ													HARD ROCK: Gray with orange staining, slightly to very slightly weathered, very close to
	‡													moderately close fracturing, hard to very hard, BIOTITE QUARTZ GNEISS (continued)
	±				1 : :								\otimes	BIOTTE COARTZ GNEISS (containded)
	+													
-	Ŧ													×F
5	±							· · · ·	· · · ·					
	+				• •									
	Ŧ													(F
	±				1								\gg	
	+												\otimes	
	Ŧ									* * * *			$\langle \rangle \rangle$	
	‡													\$ <u>+</u>
	+												$\langle \rangle \rangle$	
	Ŧ													\$F
	‡				1.1	: : :		· · · · ·					V//	
	+					1.1.1								×.
-	Ŧ													
	‡							$\begin{array}{c} \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \end{array}$						×
	±													
	ŦI													»
	‡													
	+													<u>※</u>
	Ŧ													
	±									× × × × × × × ×				×
	+								• • • •					
	ŦI													»»-
	1				1.2									(1)
	+													》 注
	Ŧ													
	‡				1									
	+												K	HARD ROCK: Gray with trace orange staining,
	Ŧ l												\gg	slightly weathered to fresh, very close to
	‡													moderately close fracturing, hard to very hard, BIOTITE QUARTZ GNEISS
	±				• •								\gg	
	ŦΙ				1									
	‡				1.1								\gg	<u>}</u>
	±													SSE .
	ŦI				1								\gg	WF
	‡				1.1									
	+												$\langle \rangle \rangle$	<u>}</u>
	Ŧ				1									WF .
	±				1 : :			* * * *						
	+													
	‡				1::								$\langle \rangle \rangle$	
	+													



SHEET 3 OF 3

BECHT	TEL PRO	JECT	10.: 25	161		MACTEC PR	ROJECT NO .:	6468-	-09-2473			_	ouisa, VA GEOLOGIST:	The second second	
ITE D	ESCRIPT	ION: N	North A	nna 3 P	rojec	t Supplemen	t 2			D	RILLER	R: D.	. Rhodes/K. Guy	FLUID LE	EVEL (ft)
ORIN	IG NO.:	M-12			-	DRILL METH	HOD: Mud Ro	otary/F	Rock Cor	D	RILL M	ACH	HINE: CME-45C Track (RAL)	0 HR.	NA
ROU	ND ELEV	.: 307	7.0 ft	(NAV	D88)	NORTHING:	3,909,723	US	ft (NAD8	3) E/	ASTIN	G:	11,685,560 US ft (NAD83)	24 HR.	27.0
OTAL	DEPTH:	151.	2ft S	AMPLE	MET	HODS: ASTN	1 D 1586-08a	; 2488	-09a; 211	3-08;	6032-0	80	ROD TYPE: AWJ HAMMER	(ID):140-Ib. A	uto (MEC
ATE	STARTED): 9/1	6/09	COMP	LETE	D: 9/21/09	HOLE DIA	: 3"	CASING	DEP	PTH: 40	5.2 f	t CORE SIZE: NQ3 BITS US	ED: 2-7/8" Tr	i-Cone
LEV.	DEPTH	BLC	DW CO	UNT	-	BLOV	VS PER FOOT	1	S	AMP.	•/	LO	SOIL AND ROCK	ESCOLOTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20 4	0 60	80	100	NO.	MOI		SOIL AND ROOM	DESCRIPTION	
157,4					*	Continued	from previou:	spage							
51.4	+					····		puge					155.8		1
-	-												 Boring and coring termin 	ated at 151.2 fe	
-	Ŧ												Boring closed by tremie	method with	
1	‡												- cement-bentonite grout.		
1	ŧ I												 24 hour water level mean prior to drilling. Borehold 	sured on 9/21/2 was at a depti	2009 h of
	‡		2										146.2 feet.		
1	±			1									-		
	t l														
	E I														
-	ΕI														
-	Ŧ														
	ŧ														
1	t I												-		
	±												E .		
	t I												-		
-	Ŧ														
-													-		
4	Ŧ I												-		
	‡												Ē		
3	t I												t l		
1	±														
	t l												t		
	Ŧ												-		
1	†												F		
	‡												E .		
	±												-		
	t I											13	2		
	Ŧ												+		
-	Ŧ											1.3	2		
	‡		1										E.		
	‡												-		
-													5		
	t I												t		
	Ŧ												-		
1	1												F		
	±												-		
19													E		
	-												-		
	‡												E.		
	1											-	-		
	+												1		



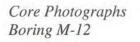
SHEET 1 OF 2

BECHTEL PROJECT NO .: 251	61	MACTEC PRO	DJECT NO .:	6468-09-2473	COUNTY:	Louisa, VA	GEOLOGIST:	B. Mabie	
SITE DESCRIPTION: North An	nna 3 Projec	t Supplement	2		DRILLER:	D. Rhodes/K. G	iuy	FLUID L	EVEL (ft)
BORING NO .: M-12		DRILL METH	OD: Mud Rol	ary/Rock Core	DRILL MA	CHINE: CME-45	C Track (RAL)	0 HR.	NA
GROUND ELEV .: 307.0 ft	(NAVD88)	NORTHING:	3,909,723	US ft (NAD83)	EASTING:	11,685,560	US ft (NAD83)	24 HR.	27.0
TOTAL DEPTH: 151.2 ft	SAMPLE	METHODS: AS	STM D 1586-	08a; 2488-09a; 2	113-08; 603	2-08	HAMMER (ID)	: 140-lb. Auto (MEC-12)
DATE STARTED: 9/16/09	COMPLE	TED: 9/21/09	CASING	DEPTH: 46.2 ft	CORE BAR	RREL TYPE: WI	reline NQ3 Triple	Tube, series 6	& 10 bits

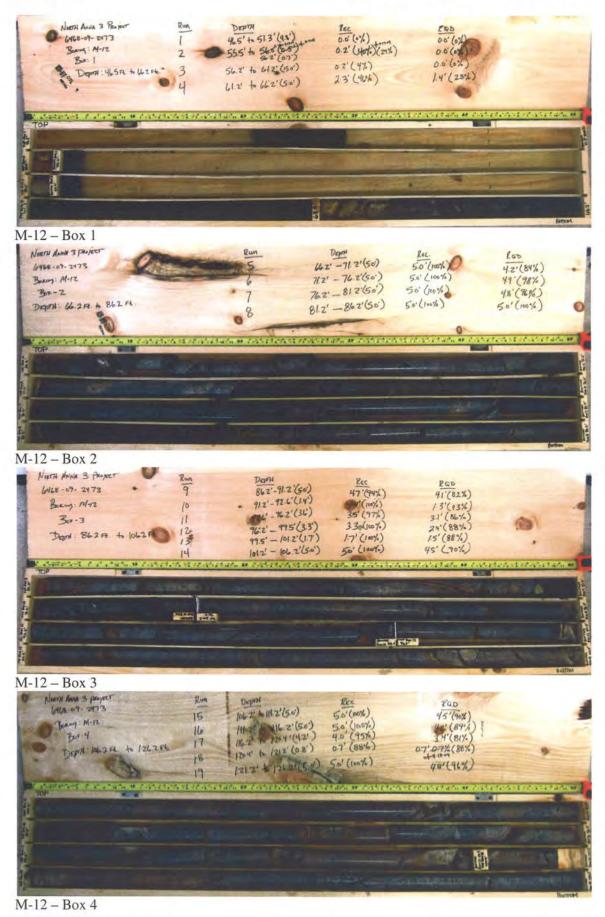
ELEV. (代)	DEPTH (ft)	RUN (fl)	DRILL RATE (Min/ft)	REC (ft)	JN RQD (ft)	SAMP. NO.	STR REC. (ft) %	ATA RQD (ft)	LOG	DESCRIPTION AND REMARKS
			1. 1. 2000	10	*		76	14		Begin Coring @ 46.5 ft
260.5	46.5	4.8	1:11 1:34 1:10 0:35 0:31/0.8	(0.0) 0%	(0.0) 0%	RUN 1	(0.4) 3%	(0.0) 0%	Y.W.Y.	 WEATHERED ROCK; Severely weathered BIOTITE QUARTZ GNEISS (Sampled as Silty SAND (SM), brownish yellow (10YR 6/6) to yellow (10YR 7/6), very dense, moist, fine to coarse grained sand) (continued) 46.5 ft: No Core recovery
	0110		N=100/0.9			SS-11			MG	
251.5	55.5	0.7	N=50/0.0 0:55/0.7	(0.2)	(0.0)	RUN 2			JAN 1	55.5 ft: Brown with black staining, severely weathered, very close fracturing, very soft to soft, BIOTITE QUARTZ GNEISS (Poor Recovery)
250.8	56.2	5.0	1:26 1:20 1:12	(0.2) 4%	0% (0.0) 0%	RUN 3			N	Very Solt to Solt, DIOTTE GOARTZ GIVEISS (FOOLRECOVERY)
245.8	61.2	5.0	1:09 0:48 2:14	(2.3)	(1.4)	RUN 4			S	_ (No recovery to 63.9 ft)
040.0			2:25 2:34 3:03 3:20	46%	28%		(2.3) 100%	(1.4) 61%		243.1 6 HARD ROCK: Brown to gray, moderately severe to very slightly weathered, 240.8 close fracturing, medium hard to hard, BIOTITE QUARTZ GNEISS (6 joints 6
240.8	66.2	5.0	2:40 3:02 2:59 4:04	(5.0) 100%	(4.2) 84%	RUN 5	(59.3) 99%	(53.9) 90%		O-70°, open with orange staining) HARD ROCK: Gray with orange staining, slightly to very slightly weathered, very close to moderately close fracturing, hard to very hard, BIOTITE QUARTZ GNEISS
235.8	71.2	5.0	3:48 3:13	(5.0)	(4.9)	RUN 6				(8 joints at 30-60°, tight to open) (5 joints at 40-50°, tight to open)
			2:48 2:37 3:00	100%	98%					(a louine ar 40-20 - riflur to obert)
230.8	76.2	5.0	3:47 2:58 3:03 3:06 5:38	(5.0) 100%	(4.8) 96%	RUN 7				(3 joints at 30-50°, tight to open; 2 joints at 80°, tight; trace homblende)
225.8	81.2	5.0	2:47 2:31 1:58 2:01	(5.0) 100%	(5.0) 100%	RUN 8				 (6 joints at 30-60°, tight to open with trace staining; trace homblende)
220,8	86.2	5.0	2:30 2:58 2:44	(4.7)	(4.1)	RUN 9				(5 joints at 0-40°, open with orange staining; 2 joints at 80°, open)
215.8	91.2	0.0	2:15 2:03 2:18 3:02	94%	82%					to fail to at o the topolit that or angle data might plante at our politicity
215.0	92.6	1.4	2:07	(1.4)	(1.3)	RUN 10				_ (2 joints at 0°, open; 2 joints at 80°, tight)
240.0	96.2	3.6	1:36/0.6 2:49 3:03	(3.5) 97%	(3.1) 86%	RUN 11				(3 joints at 0°, tight to open with trace orange staining; 1 joint at 70°)
210.8		3.3	3:23 3:05 2:49	(3.3) 100%	(2.9) 88%	RUN 12	2			 (1 joint at 30°, open with trace orange staining; 4 joints at 50-60°, open with trace orange staining)
207.5		1.7	3:59 0:48/0.3 1:49/0.7	(1.7)	(1.5)	RUN 13				(3 joints at 20-30°, tight with trace orange staining)
205.8	101.2	5.0	2:30 3:06 3:02 3:13	(5.0) 100%	(4.5)	RUN 14				 (8 joints at 50-60°, tight to open with orange staining)
200.8	106.2	5.0	3:03 3:13 4:07 3:45 3:26	(5.0) 100%	(4.5) 90%	RUN 15				(3 joints at 0°, tight: 4 joints at 40-70°, open)
195.8	111.2		3:43 3:58						11	Construction of the second second second
		5.0	2:52 2:51 2:09	(5.0) 100%	(4.2) 84%	RUN 16				(3 joints at 0°, tight to open; 6 joints at 60-70°, open)
190.8	116.2		2:15 2:48							
		4.2	2:40 2:46 2:37	(4.0) 95%	(3.4) 81%	RUN 17				(4 joints at 10-30°, open; 3 joints at 60-70° open)
186,6	120.4		3:05	-	-	RUN 18				



ORING ROUNE OTAL D ATE ST LEV: D (ft) 185.8 180.8	NO.: DELEV DEPTH: ARTEL	M-12 (.: 3 151. D: 9/ RUN (ft) 5.0	307.0 ft .2 ft /16/09 DRILL RATE (Min/ft)	(NAVI SAMI	D88) N PLE M PLETE	DRILL ME IORTHIN ETHODS D: 9/21/	G: 3,	909,72 1 D 15	23 86-08	DRILLER: D. Rhodes/K. Guy FLUID LEVEL (f ary/Rock Core DRILL MACHINE: CME-45C Track (RAL) 0 HR. N US ft (NAD83) EASTING: 11,685,560 US ft (NAD83) 24 HR. 27 08a; 2488-09a; 2113-08; 6032-08 HAMMER (ID): 140-Ib. Auto (MEC-1)
ORING ROUNE OTAL D ATE ST LEV. D 185.8/ 185.8/ 180.8 175.8 171.5	NO.: DELEV DEPTH: CARTEL DEPTH (ft) 121.2	M-12 (.: 3 151. D: 9/ RUN (ft) 5.0	007.0 ft .2 ft /16/09 DRILL RATE (Min/ft)	(NAVI SAMI COM	D88) N PLE MI PLETE	DRILL ME IORTHIN ETHODS D: 9/21/	G: 3,	909,72 1 D 15	23 86-08	ary/Rock Core DRILL MACHINE: CME-45C Track (RAL) 0 HR. N US ft (NAD83) EASTING: 11,685,560 US ft (NAD83) 24 HR. 27.
ROUNE OTAL D ATE ST LEV. D (ft) D 185.8 185.8	DELEV DEPTH: CARTEL DEPTH (ft) 121.2	(.: 3 151. D: 9/ RUN (ft) 5.0	307.0 ft .2 ft /16/09 DRILL RATE (Min/ft)	COM	D88) N PLE M PLETE	IORTHIN ETHODS D: 9/21/	G: 3, : ASTN	909,72 1 D 15	23 86-08	US ft (NAD83) EASTING: 11,685,560 US ft (NAD83) 24 HR. 27.
OTAL D ATE ST LEV. D 185.8/ 180.8 175.8	DEPTH: CARTEL DEPTH (ft) 121.2	151. 2: 9/ RUN (ft) 0.8 5.0	2 ft /16/09 DRILL RATE (Min/ft)	COM		ETHODS D: 9/21/	: ASTI	1 D 15	86-08	
ATE ST	DEPTH (ft)	P: 9/ RUN (ft)	DRILL RATE (Min/ft)	COM	JN RQD	D: 9/21/				test eres a set er test
LEV. D (ft) 185.8/ 180.8 175.8	EPTH (ft) 121.2	RUN (ft) 0.8 5.0	DRILL RATE (Min/ft)	RU	JN RQD	-	-		UD	DEPTH: 46.2 ft CORE BARREL TYPE: Wireline NQ3 Triple Tube, series 6 & 10 b
(ft) 185.8/ 180.8 175.8	(ft) 121.2	(ft) 0.8 5.0	RATE (Min/ft)		RQD	PALE				
180.8 175.8 171.5		5.0			%	SAMP, NO.	STR REC. (ft) %	ATA RQD (ft) %	LOG	
180.8 175.8 171.5		5.0								Continued from previous page
175.8	120.2	F.0	2:49 3:02 2:48 3:21	(0.7) 88% (5.0) 100%	(0.7) 88% (4.8) 96%	RUN 19				 (1 joint at 60°, tight) (3 joints at 0°, tight; 4 joints at 70-80°, tight) HARD ROCK: Gray with orange staining, slightly to very slightly weathered, very close to moderately close fracturing, hard to very hard, BIOTITE QUARTZ 180.8 CNEISE (caption of)
171.5	_	5.0	3:38 3:26 3:31 3:06	(5.0) 100%	(5.0) 100%	RUN 20	(24.8) 99%	(22.7) 91%		HARD ROCK: Gray with trace orange staining, slightly weathered to fresh, very close to moderately close fracturing, hard to very hard, BIOTITE QUARTZ
171.5	131.2	4.3	3:59 3:40 3:58 2:52	(4.3) 100%	(4.0) 93%	RUN 21				GNEISS (3 joints at 20°, tight; 1 joint at 50°, tight) (3 joints at 40-50°, tight to open; 1 joint at 90°, tight)
	135.5 136.2	0.7	3:16 3:08 1:38/0.3 2:11/0.7	(0.7)	(0.7)	RUN 22 RUN 23				 (1 joint at 70°, tight) (1 joint at 0°, open; 11 joints at 50-60°, tight to open; 1 joint at 90°, open)
167.6	139,4	3.2	3:00 2:20 2:45 1:08/0.2	(3.2) 100% (1.6)	(2.0) 63% (1.6)	RUN 24				(1 joint at 40°, tight)
100.0	191.2	5.0	2:03/0.8 2:17 2:27 2:08 2:42	(1.0) 89% (5.0) 100%	(1.6) 89% (4.4) 88%	RUN 25				(1 joint at 0°, open; 2 joints at 20-30°, open; 1 joint at 70°, tight)
160.8	146.2	5.0	3:08 2:58 3:34 2:57	(5.0) 100%	(5.0) 100%	RUN 26				(3 joints at 0-10", tight; 1 joint at 40", tight)
155.8	151.2		3:06 3:19 3:07				-			155.8
				1						Boring and coring terminated at 151.2 feet.
										Boring closed by tremie method with cement-bentonite grout.
										24 hour water level measured on 9/21/2009 prior to drilling. Borehole was at a depth of 146.2 feet.



North Anna 3 Project MACTEC Project No. 6468-09-2473



Core Photographs Boring M-12 North Anna 3 Project MACTEC Project No. 6468-09-2473

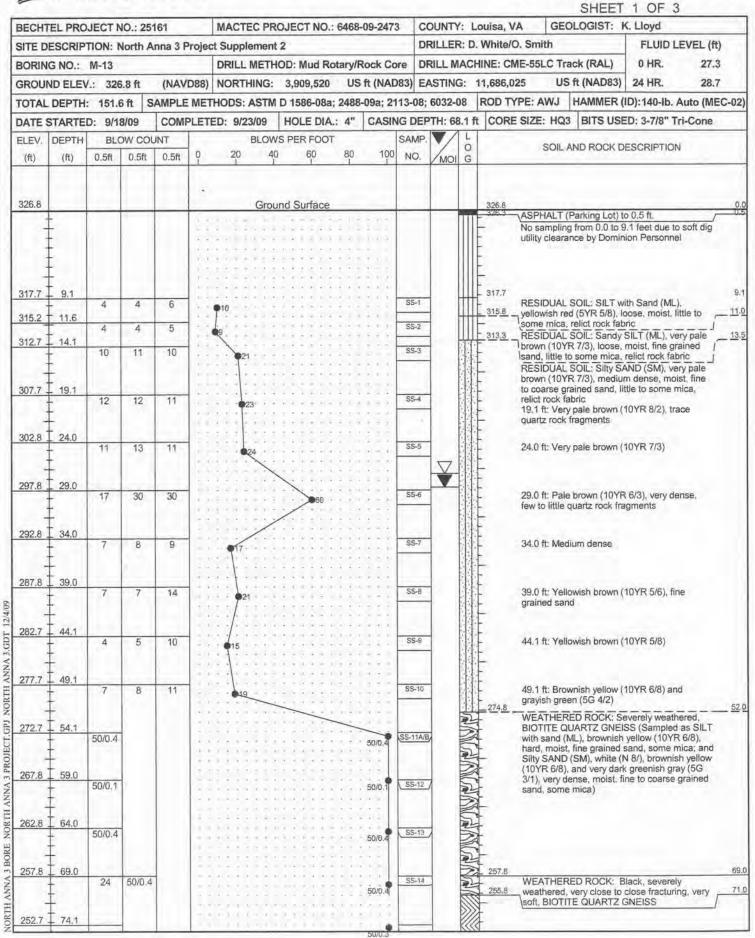


M-12 - Box 6



Prepared By JST Date 12/16/05

Checked By MAL Date 2/16/09



Volume 1, Revision 0



O.: M-13 ELEV.: 320 PTH: 151. RTED: 9/1	5.8 ft 6 ft S	(NAVD88 AMPLE MI COMPLE	B) NORTHING: ETHODS: ASTM TED: 9/23/09 BLOW 20 4	IOD: Mud Rot 3,909,520 D 1586-08a; HOLE DIA.: /S PER FOOT	4" CASING	e D 33) E 3-08;	RILL M. ASTING ; 6032-0 PTH: 68 MOI	ACHII 5: 11 18 R	ROD TYPE: AWJ HAMMER (IE	rown (10YR 5/4 to ining, moderately hered, close to
ELEV.: 320 PTH: 151. RTED: 9/1 PTH BL(0.5ft 50/0.3 3.0 50/0.1 4.0	6 ft S. 8/09 DW COL	AMPLE MI COMPLE INT 0.5ft 0	B) NORTHING: ETHODS: ASTM TED: 9/23/09 BLOW 20 4	3,909,520 D 1586-08a; HOLE DIA.: /S PER FOOT 0 60	US ft (NAD2 2488-09a; 211 4" CASING 80 100	 B3) E B3-08; /ul>	ASTING ; 6032-0 PTH: 68	5: 11 18 R .1 ft L	1,686,025 US ft (NAD83) ROD TYPE: AWJ HAMMER (IE CORE SIZE: HQ3 BITS USEE SOIL AND ROCK DE HARD ROCK: Yellowish br 10YR 5/6), with orange stai	24 HR. 28.7 D):140-Ib. Auto (MEC D: 3-7/8" Tri-Cone SCRIPTION
PTH: 151. RTED: 9/1 PTH BL(0.5ft 50/0.3 0.0 50/0.1 4.0	6 ft S. 8/09 DW COL	AMPLE MI COMPLE INT 0.5ft 0	B) NORTHING: ETHODS: ASTM TED: 9/23/09 BLOW 20 4	3,909,520 D 1586-08a; HOLE DIA.: /S PER FOOT 0 60	US ft (NAD2 2488-09a; 211 4" CASING 80 100	33) E 3-08; 3 DEI 5AMP NO. 85-15	; 6032-0 PTH: 68	8 R .1 ft L	ROD TYPE: AWJ HAMMER (II CORE SIZE: HQ3 BITS USEI SOIL AND ROCK DE HARD ROCK: Yellowish br 10YR 5/6), with orange stai	D):140-Ib. Auto (MEC D: 3-7/8" Tri-Cone SCRIPTION
RTED: 9/1 PTH BL(t) 0.5ft 50/0.3 0.0 50/0.1 4.0	8/09 DW COL	COMPLE	ETED: 9/23/09 BLOW 20 4	HOLE DIA.: VS PER FOOT	4" CASING	SAMP NO.	MOI	.1 ft	CORE SIZE: HQ3 BITS USEI SOIL AND ROCK DE HARD ROCK: Yellowish br 10YR 5/6), with orange stai	D: 3-7/8" Tri-Cone SCRIPTION
RTED: 9/1 PTH BL(t) 0.5ft 50/0.3 0.0 50/0.1 4.0	8/09 DW COL	0.5ft 0	BLOV 20 4	/S PER FOOT) 60	80 100	SAMP NO. SS-15	MOI	L	SOIL AND ROCK DE HARD ROCK: Yellowish br 10YR 5/6), with orange stai	SCRIPTION rown (10YR 5/4 to ining, moderately hered, close to
PTH BL(0.5ft 50/0.3 50/0.1 4.0	ow cou	0.5ft 0	20 4	0 60	80 100	NO. SS-15	моі		HARD ROCK: Yellowish br 10YR 5/6), with orange stai	rown (10YR 5/4 to ining, moderately hered, close to
50/0.3 9.0 50/0.1	0.5ft	0.011				SS-15			HARD ROCK: Yellowish br 10YR 5/6), with orange stai	rown (10YR 5/4 to ining, moderately hered, close to
9.0 50/0.1 4.0				rom previous	page		J		_ 10YR 5/6), with orange stai	ining, moderately hered, close to
9.0 50/0.1 4.0				rom previous	page		1		_ 10YR 5/6), with orange stai	ining, moderately hered, close to
9.0 50/0.1 4.0			Continued	rom previous	50/0.1.				_ 10YR 5/6), with orange stai	ining, moderately hered, close to
9.0 50/0.1 4.0					50/0.1	SS-16		1		hered, close to
50/0.1						SS-16		ccer		
4.0					50/0.1.	AND ILL		111	moderately close fracturing moderately hard, BIOTITE	OLIARTZ CNEISS
				· · · · · · ·				115	(continued)	WOANTZ GIVEISS

					50/0.1	SS-17				

		1								

		(C) (C) (C)	*******	* * * * * * *	64 + 6 + 6 + 6 6 + 4 + 5 + 5 + 5			Mr-	-	
		3						4	233.0 WEATHERED ROCK: Sev	io sellu use etherse d
								3	BIOTITE QUARTZ GNEIS	
		-		$x_{i}^{*} + x_{i}^{*} + x_{i$	*****			3	3	
		-			******			24	227.7 HARD ROCK: Yellowish br	rown to gravish
				******	8 * * * * * * 8 * * * * *				brown and gray, with orang	e staining,
		1							 moderately severe to mode close to moderately close fit 	racturing, medium
		(* 	*******	*****					hard to moderately hard, B GNEISS	IOTITE QUARTZ
		4		******				111		
			*******	******				11		
								3))}	109.6 ft: Complete loss of o	drill fluid circulation
									for remainder of boring.	
		3						***		

				******				*		
		8		******	******			11		
								112		
		-7			* * * * * * *			\$		
		-		******						
		1						3))}		
					* * * * * *					

				******	******					
								11		
			+ + + + + + + +	+ + + + + +				111		
				******	******			115	-	
		1						111		
			*******		******			54	WEATHERED ROCK: Sev	verely weathered.
								N	BIOTITE QUARTZ GNEIS	S (No Recovery)
								A	182.7 HAPD POCK: Grouwith or	range staining
		1	*******						moderately to slightly weat	hered, close to
								1112-	 moderately close fracturing 	, hard, BIOTITE
										186.7 WEATHERED ROCK: Sev BIOTITE QUARTZ GNEIS 182.7 HARD ROCK: Gray with of





SHEET 3 OF 3

							_	_					-			3 OF 3	3	_
BECHTEL			_					JECT NO .:	6468	-09-2473					EOLOGIST: I	1		_
			North A	Anna 3 F	Projec	t Supplem					_		-	. White/O. Smith			EVEL (ft)	
BORING	NO.:	M-13				DRILL ME	THC	D: Mud Ro	tary/F	Rock Co	re Di	RILL N	ACH	HINE: CME-55LC 1	rack (RAL)	0 HR.	27.3	
GROUND	ELEV	.: 326	.8 ft	(NAV	D88)	NORTHIN	G:	3,909,520	US	ft (NAD	83) E	ASTIN	G:	11,686,025 L	JS ft (NAD83)	24 HR.	28.7	2
TOTAL DE	EPTH:	151.6	oft S	SAMPLE	MET	HODS: AS	TM C	0 1586-08a;	2488	-09a; 21	13-08;	6032-	80	ROD TYPE: AWJ	HAMMER (ID):140-lb.	Auto (MEC	C-1
DATE STA	ARTE	D: 9/18	3/09	COM	PLET	ED: 9/23/0	9	HOLE DIA.	: 4"	CASIN	IG DEF	PTH: 6	8.1 f	t CORE SIZE: HO	23 BITS USI	ED: 3-7/8" T	ri-Cone	
ELEV. DE	EPTH	BLC	ow co	UNT				PER FOOT			SAMP.	V	LO	SOIL	AND ROCK D	ESCRIPTION	V	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	NO.	MO		501	LAND NOON D			_
-													117					
177.2					-	Continue	ad fro	om previous	nan									
111.2			-	1			1.4.1				-		111	-				
F			-	-			-				-		>>>	Boring an	d coring termina	ated at 151.6	feet.	15
Ŧ														Boring clo cement-be	esed by tremie n entonite grout	nethod with		
														NOTE: Af mud rotar 69.0 ft and that the ro to 84.0 ft, joint/fractu solid, und of rock at between 7	ter boring was a d rock coring be blier cone had "v most likely alor ure or zone of w ately 68.0 feet. isturbed HARD 71.0 ft. SPT sa 71.0 to 84.0 feet isonclusion.	ing was adva egan. It is app valked off" ac ig a high ang eakness at Core recover ROCK indic amples collec	nced to parent livancing le y of ates top ted	



SHEET 1 OF 2

BECHTEL PROJECT NO .: 251	61	MACTEC PRO	OJECT NO .: (6468-09-2473	COUNTY:	Louisa, VA	. Lloyd		
SITE DESCRIPTION: North Ar	nna 3 Projec	t Supplement	DRILLER:	D. White/O. Sm	FLUID L	EVEL (ft)			
BORING NO.: M-13		DRILL METHO	OD: Mud Rot	ary/Rock Core	DRILL MAG	CHINE: CME-55	LC Track (RAL)	0 HR.	27.3
GROUND ELEV .: 326.8 ft	(NAVD88)	NORTHING:	3,909,520	US ft (NAD83)	EASTING:	11,686,025	US ft (NAD83)	24 HR.	28.7
TOTAL DEPTH: 151.6 ft	SAMPLE	METHODS: AS	STM D 1586-0	8a; 2488-09a; 2	113-08; 603	2-08	HAMMER (ID):	140-lb. Auto	(MEC-02)
DATE STARTED: 9/18/09	COMPLE	TED: 9/23/09	CASING D	EPTH: 68.1 ft	CORE BAR	RREL TYPE: Wi	ube, series 6	bit	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC, (ft) %	IN RQD (ft)%	SAMP. NO.	STR REC. (ft) %	ATA ROD (ft) %	LOG	DESCRIPTION AND REMARKS	
					*					Begin Coring @ 69.0 ft	
257.8 255.2	69.0 71.6	2.6	N=50/0.4 1:14 1:33	(1.1) 42%	(0.6) 23%	RUN 1	(0.5) 50%	(0.0) 0%	R	257.8 WEATHERED ROCK: Black, severely weathered, very close to close 255.8 fracturing, very soft, BIOTITE QUARTZ GNEISS	69 71
250.2	76.6	5.0	1:32/0.6 1:14 1:46 1:44 N=50/0.3	(4.3) 86%	(3.2) 64%	RUN 2 SS-15	(22.0) 96%	(19.8) 87%		 (2 joints at 60°, tight) HARD ROCK: Yellowish brown (10YR 5/4 to 10YR 5/6), with orange staining, moderately severe to moderately weathered, close to moderately close fracturing, medium hard to moderately hard, BIOTITE QUARTZ GNEISS (1 joint of 10°, itet) 	
		5.0	1:52 1:59 2:00 1:39 1:32 N=50/0.1	(5.0) 100%	(5.0) 100%	RUN 3 SS-16				 (1 joint at 0-10°, tight) (1 joint at 30°, tight; 3 joints at 60-70°, tight) (4 joints at 30-40°, open with trace clay and iron staining; 1 joint at 70°, tight with trace clay and iron staining) 	
245.2	81.6	5.0	1:16 1:32 1:38 1:42 1:14 N=50/0.1	(4.9) 98%	(4.9) 98%	RUN 4 SS-17				(3 joints at 50-60°, tight with trace clay and iron staining)	
240.2	86.6	5.0	1:30 1:09 1:39 2:09 1:29 1:18	(5.0) 100%	(3.9) 78%	RUN 5				(1 joint at 70°, tight with trace clay and Iron stain; 3 joints at 80-90°, tight with trace clay and iron staining)	
235.2	91.6	5.0	1:08	(2.2)	(2.2)	RUN 6				(1 joint at 10-20°, open with little iron staining)	
230.2	96.6		1:24 1:30 1:21 1:14	44%	44%		(0.0) 0%	(0.0) 0%		233.0 WEATHERED ROCK: Severely weathered, BIOTITE QUARTZ GNEISS (No Recovery)	93
- CONTR.	to serve a	5.0	1:08 1:25	(3.5) 70%	(3.0) 60%	RUN 7			S	-	99
225.2	101.6	5.0	1:24 1:36 1:32 1:35			RUN 8	(39.6) 97%	(31.8) 78%		 227.7 HARD ROCK: Yellowish brown to grayish brown and gray, with orange staining, moderately severe to moderately weathered, close to moderately close fracturing, medium hard to moderately hard, BIOTITE QUARTZ GNEISS 	95
220.2	106.6	5.0	1:44 1:51 2:03 1:56	(4.8) 96%	(4.4) 88%	North				 (1 joint at 0-10°, tight with trace clay; 2 joints at 60-70°, open with clay) (1 joint at 50-60°, tight with trace iron stain) 	
	100.0	5.0	1:48 1:59 2:36 3:05	(5.0) 100%	(4.3) 86%	RUN 9				 (2 joints at 20-30°, open with iron staining; 1 joint at 70°, open with clay and iron staining) 109.6 ft: Complete loss of drill fluid circulation for remainder of boring. 	
215.2	111.6	5.0	2:25 1:34 1:48 1:32 2:06	(5.0) 100%	(4.4) 88%	RUN 10				(4 joints at 0-10°, open with iron staining; 2 joints at 70°, tight with trace clay and iron stain)	
210.2	116.6	5.0	1:42 1:54 1:54 1:24 1:32	(4.7) 94%	(4.0) 80%	RUN 11				(3 joints at 0-15°, open with iron staining; 3 joints at 70°, tight with trace clay and iron staining)	
205.2	121.6	.5.0	1:47 2:03 3:00 1:56 1:54	(4.1) 82%	(2.7) 54%	RUN 12	-			(3 joints at 30-40°, open with clay and iron staining; 3 joints at 60-70°, tight with trace clay and iron staining; trace magnetite)	
200.2	126.6	5.0	2:24 2:38 2:57 2:43	(5.0) 100%	(4.6) 92%	RUN 13				(3 joints at 0-10°, open with iron staining; 2 joints at 30°, open with clay and iron staining, 1 joint at 80°, tight with trace clay and iron staining)	
195.2	131.6	5.0	2:05 2:26 1:42 2:06 2:36	(4.0) 80%	(2.7) 54%	RUN 14				(7 joints at 30-40°, open with iron staining)	
190.2	136.6	5.0	2:42 2:47 2:56 2:15	(3.5)	(1.7) 34%	RUN 15				(8 joints at 0-10°, tight to open with clay and iron staining)	
			2:32 2:52	70%	3470			10.55		186.7	:14
185.2	141.6	5.0	1:49 1:51 1:21	(2.5)	(1.6) 32%	RUN 16	(0.0)	(0.0) 0%	-JUN	WEATHERED ROCK: Severely weathered, BIOTITE QUARTZ GNEISS (No. Recovery)	

(a) and iron stain) (3 joints at 10-20°, tight to open with clay and iron staining; 1 joint at 90°, tight

NOTE: After boring was advanced to 84.0 ft by mud rotary methods, casing was advanced to 69.0 ft and rock coring began. It is apparent that the roller cone had "walked off" advancing to 84.0 ft, most likely along a high angle joint/fracture or zone of weakness at approximately 68.0 feet. Core recovery of solid, undisturbed HARD ROCK indicates top of rock at 71.0 ft. SPT samples collected between 71.0 to 84.0 feet are in agreement with this conclusion.

with trace clay and orange staining)

Boring and coring terminated at 151.6 feet.

Boring closed by tremie method with cement-bentonite grout.



2:36 2:37

2:10

151.6

175.2

SHEET 2 OF 2

151.6

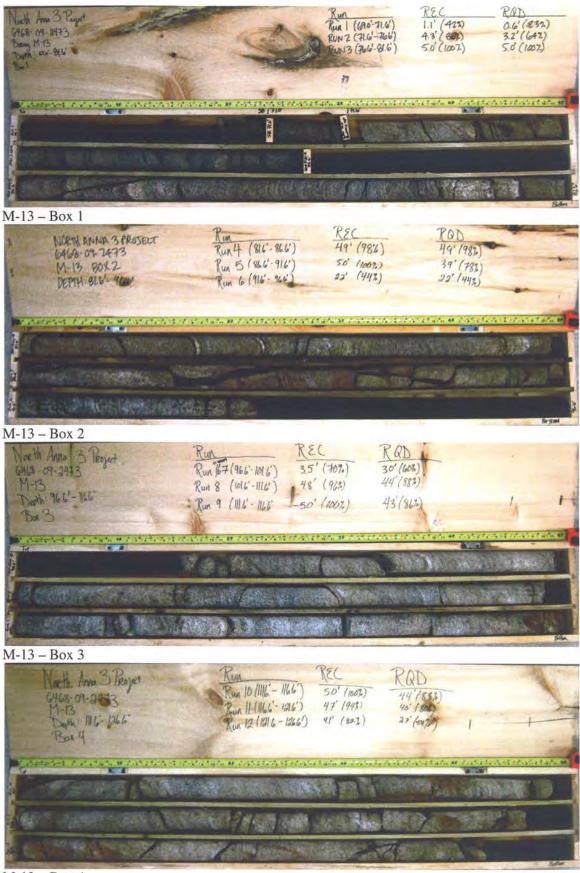
BECHT	TEL PRO	JECT	NO.: 251	61		MACTEC	PROJ	ECT N	0.: 6	6468-09-2473	COUNTY:	Louisa, VA	GEOLOGIST: K.	Lloyd		
SITE D	ESCRIP	TION:	North An	na 3 Pr	roject	t Supplem	ent 2				DRILLER:	D. White/O. Sm	ith	FLUID L	EVEL (ft)	
BORIN	G NO.:	M-13				DRILL ME	THOD	: Mud	Rota	ary/Rock Core	DRILL MA	CHINE: CME-55	LC Track (RAL)	0 HR.	27.3	
GROU	ND ELEN	/.: 3	26.8 ft	(NAVE	088)	NORTHIN	G: 3	,909,52	20	US ft (NAD83)	EASTING:	11,686,025	US ft (NAD83)	24 HR.	28.7	
TOTAL	DEPTH	: 151.	6 ft	SAM	PLE	METHODS	: ASTI	M D 15	86-0	8a; 2488-09a; 2	2113-08; 6032-08 HAMMER (ID): 140-Ib. Auto (MEC-02					
DATE	STARTE	D: 9/	18/09	COM	PLET	ED: 9/23/	09	CASIN	IG D	EPTH: 68.1 ft	CORE BAI	RREL TYPE: Wi	reline HQ3 Triple T	ube, series 6	bit	
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	JN RQD (ft)	SAMP. NO.	STF REC. (ft) %	RATA ROD (ft)	LOG				I AND REMARKS			
180.2	5.0 2:51			(5,0) 100%	(4.6) 92%		(7.5) 100%	(6.2) 83%		close t (4 joint	o moderately is at 0-10°, tig id iron stain)	with orange stain close fracturing, h t to open with irc	ing, moderately to sligh nard, BIOTITE QUART, n staining; 1 joint at 90	Z GNEISS)°, tight with tra	ice	

175.2

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

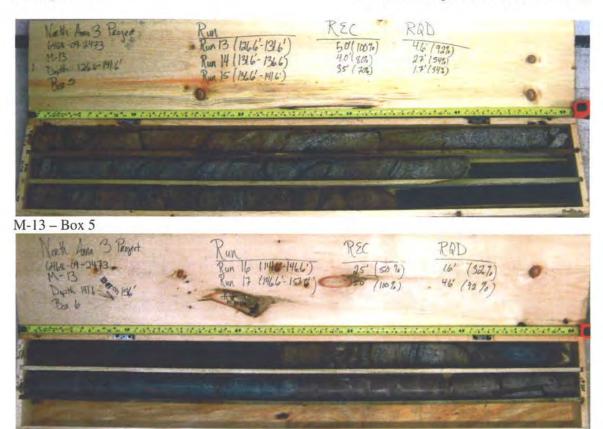
Volume	1, Revision	0
--------	-------------	---

North Anna 3 Project MACTEC Project No. 6468-09-2473



M-13 – Box 4

North Anna 3 Project MACTEC Project No. 6468-09-2473



M-13 - Box 6



GEOTECHNICAL BORING LOG Prepared By JJJ Date 12/16/89

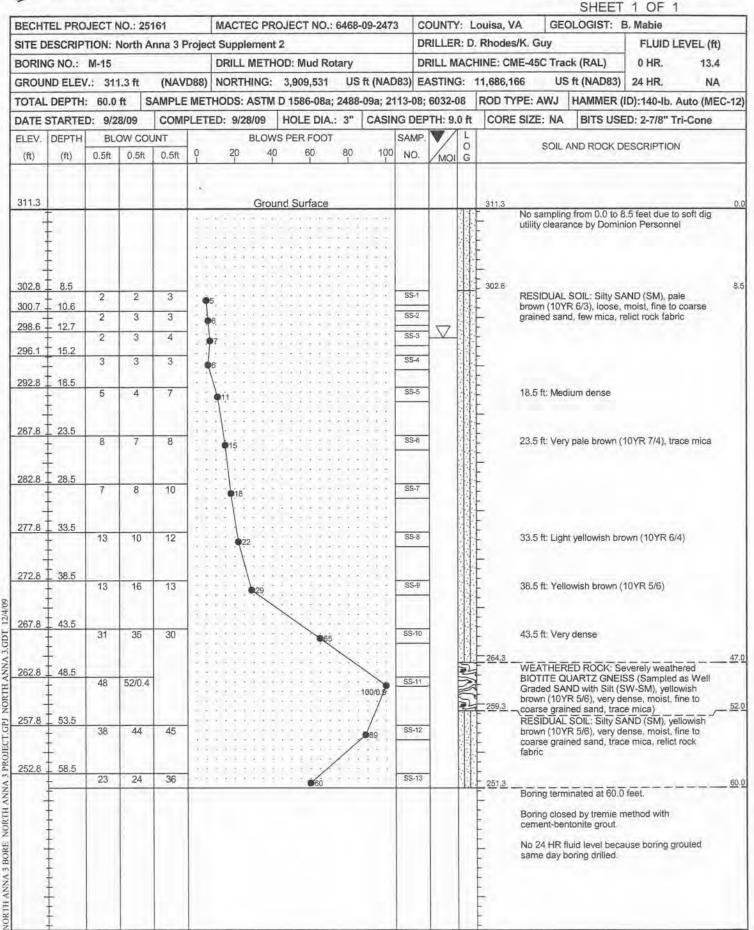
Checked By Mar Date 12/16/09

BECHTI	LL FRO	JECTI	Q 20	101		MACTEC PF	toolor mon	0.00			OUNT	C. Lloyd		
SITE DE	SCRIP	TION: N	North A	nna 3 P	roje	ct Supplemen	t 2			D	RILLER	R: D	. White/O. Smith	FLUID LEVEL (ft)
BORING	G NO.:	M-14				DRILL METH	HOD: Mud Rot	tary		D	RILL M	ACI	HINE: CME-55LC Track (RAL)	0 HR. ND
GROUN	ID ELEN	/.: 323	3.8 ft	(NAVI	D88)	NORTHING:	3,909,452	US	ft (NAD	83) E	ASTIN	G:	11,686,111 US ft (NAD83)	24 HR. ND
TOTAL	DEPTH	: 60.3	ft S	AMPLE	ME	THODS: ASTN	1 D 1586-08a;	2488	-09a; 21	13-08	; 6032-0	80	ROD TYPE: AWJ HAMMER (D):140-Ib. Auto (MEC-
DATE S	TARTE	D: 9/2	4/09	COMP	LET	ED: 9/24/09	HOLE DIA .:	3"	CASIN	G DE	PTH: 8.	6 ft	CORE SIZE: NA BITS USE	D: 2-7/8" Tri-Cone
ELEV.	DEPTH	BLC	ow co	UNT			VS PER FOOT			SAMP		L	SOIL AND ROCK D	ESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 I	20 4	0 60	80	100	NO.	MOI			
323.8						Gro	und Surface						323.8	
1					~			111	111				 No sampling from 0.0 to 8 utility clearance by Domin 	
+					1715	11111	1 3 4 4 4 X		$\tau \in \Sigma$				2	
t					8.4									
1									1				L	
314.9	8.9	5	5	5		010				SS-1	-		314.9 RESIDUAL SOIL: Silty SA	
312.5	11.3	4	5	6						SS-2	-		yellow (10YR 6/8), loose, grained sand, little mica, f	moist, fine to coarse
309.9	13.9	4	0	0	4.9	11					-		 fragments, relict rock fabri 11.3 ft: Medium dense 	
+		4	4	6		•10				SS-3	-		13.9 ft: Light yellowish bro	wn (10YR 6/4), loose
Ŧ									1 . 1				-	
304.9	18.9	5	8	9		1				SS-4			18.9 ft: Brownish yellow (1	0YR 6/8), medium
Ŧ									100	-	-		dense, few to little mica	and the second sec
300.0	23.8	1											F	
-	-	7	7	7			• * * * * * * * * • * • • * * *			SS-5			23.8 ft: Brownish yellow (1 few mica	IOYR 6/6), trace to
Ŧ								1 	1.0.1					
295.0	28.8	7	11	13					1.1.1	SS-6	-		28.8 ft: Brownish yellow (1	10YR 6/8)
Ŧ				10		/	******		1 8				Ŧ	/
290.0	33.8					:/:								
-	-	4	5	6		¢11				SS-7	1		33.8 ft: Light brownish gra grained sand	y (10YR 6/2), fine
ŧ					2.				* * * * * *				graniou sano	
285.0	38.8	6	8	7	1.		сана к алала Калаларана		11.1	SS-8			38.8 ft: Light brownish gra	v (10YR 6/2) and
1		0	Ū.			• • • • • • • • •			* * *		-		grayish brown (10YR 5/2)	little to some mica
280.0	43.8							4 4 4 9 5 4	1 1 1 1 1 1				F	
200.0	-	4	6	7					* * * * *	SS-9			43.8 ft: Grayish brown (10	YR 5/2)
+								1. I 1	* 1 s * 4 s				F	
275.0	48.8	5	6	9					* * *	SS-10			48.8 ft: Yellowish brown (1	10YR 5/6)
4		5	0	9	1.	. 15			• • • • • •	55-10	-			
270.0	- 53.8							* * *	222				F	
270.0		3	6	18		24				SS-11			53.8 ft: Brownish yellow (coarse grained sand	10YR 6/8), fine to
1					13		~	E 1 0 8 - 4	* ()				-	
265.0	58.8	40	40	50				~		55-12	-		50 0 0 Croy inh harris / 40	VP 5/2) year dense
-		13	40	50	-	CERTIFICATION OF	+ > + + + + + +		090	33-12	-	114	58.8 ft: Grayish brown (10 some mica, little quartz ro	ck fragments
1			6										- Boring terminated at 60.3	
+													Boring closed by tremie m cement-bentonite grout.	nethod with
1													No 24 HR fluid level beca	use boring grouted
-	2												same day boring drilled.	are pointed apprending
1													2	
1			1	1	1						1	1		

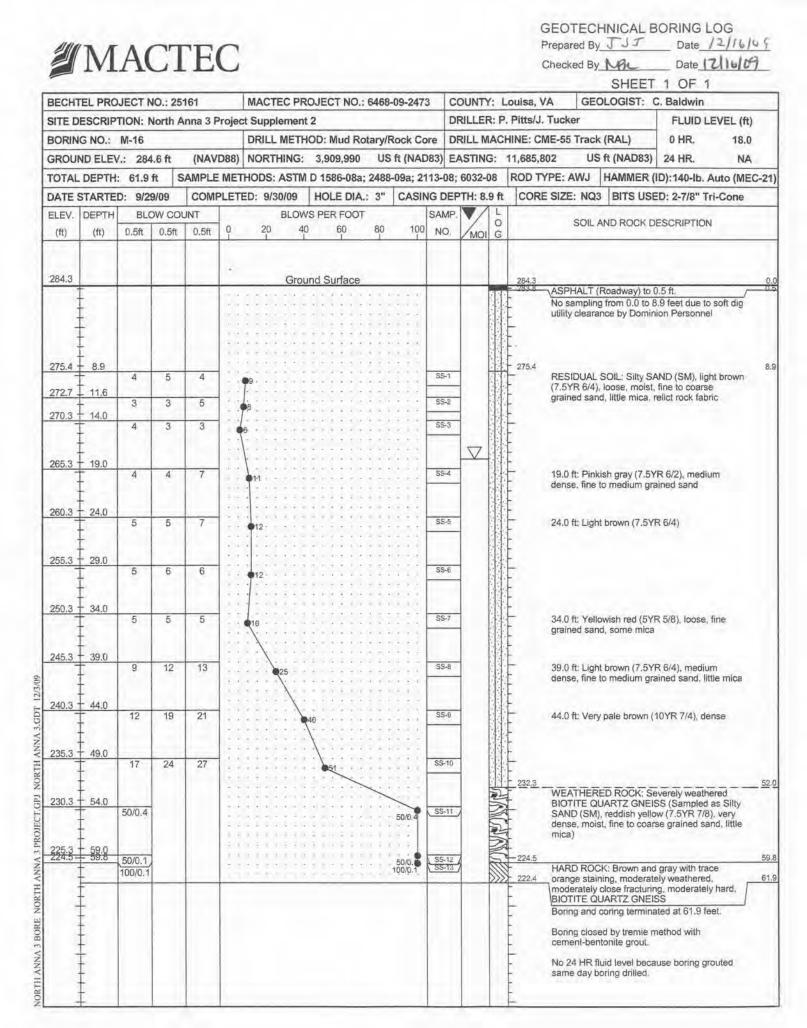


Prepared By JIJ Date 12/16/09

Checked By NRL Date 12/16/09



DCN NAP307



MACTEC

SHEET 1 OF 1

BECHTEL PROJECT NO .: 251	61	MACTEC PRO	DJECT NO .:	6468-09-2473	COUNTY:	Louisa, VA	GEOLOGIST: C	. Baldwin		
SITE DESCRIPTION: North Ar	na 3 Projec	t Supplement	2		DRILLER:	P. Pitts/J. Tuck	ker	FLUID L	EVEL (ft)	
BORING NO .: M-16		DRILL METHO	DD: Mud Rot	tary/Rock Core	DRILL MAG	CHINE: CME-5	5 Track (RAL)	0 HR.	18.0	
GROUND ELEV .: 284.6 ft	(NAVD88)	NORTHING:	3,909,990	US ft (NAD83)	EASTING:	11,685,802	US ft (NAD83)	24 HR.	NA	
TOTAL DEPTH: 61.9 ft	SAMPLE	METHODS: AS	STM D 1586-	08a; 2488-09a; 2	113-08; 603	2-08	HAMMER (ID):	ER (ID): 140-Ib. Auto (MEC-21)		
DATE STARTED: 9/29/09 COMPLETED: 9/30/09 CASING DEPTH:					CORE BAR	RREL TYPE: W	ireline NQ3 Triple T	ube, series 6	bit	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	ATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS	
1										Begin Coring @ 59.9 ft	
224.4	59.9 61.9	2.0	3:00	(2.0)	(2.0)	RUN 1	(2.0)	(2.0)		 HARD ROCK: Brown and gray with Trace orange staining, moderately weathered, moderately close fracturing, moderately hard, BIOTITE QUARTZ (SNEES (continued)) (1 joint at 90°, tight with trace clay) Boring and coring terminated at 61.9 feet. Boring closed by tremie method with cement-bentonite grout. No 24 HR fluid level because boring grouted same day boring drilled. 	

North Anna 3 Project MACTEC Project No. 6468-09-2473

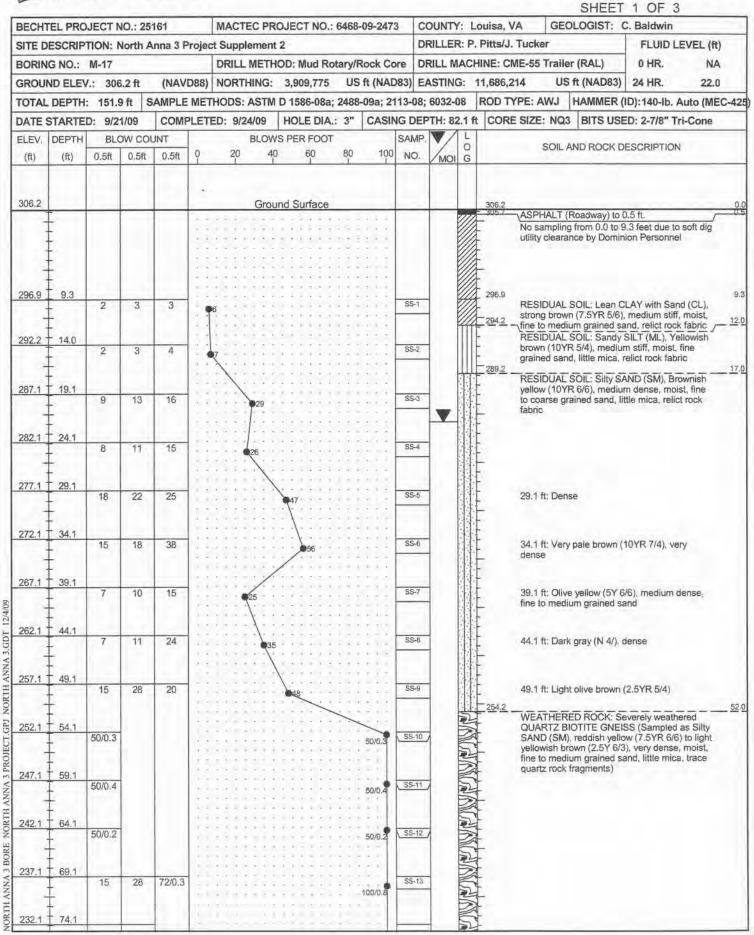


M-16 - Box 1



Prepared By JJJ Date 12/16/09

Checked By MA Date 12/16/09



Volume 1, Revision 0





DECUT	EL PRO	IFOT	10.0	161	-	MACTEC	ROJECT NO .:	6469	00.2472	100	UNITY	1.1	ouisa, VA	GEOLOGIST:	2 OF 3		-
					Decis	1.000 0.000 0.000	CORDER COAR	0400	-03-24/3	-	_		Pitts/J. Tucker		1	EVEL (ft)	-
			North A	unna 3 F	rojec	ct Supplemen		in a sh	De als Car	-				ailes (DAL)		-	
10.000	G NO.:						HOD: Mud Ro	-		-			INE: CME-55 Tr		0 HR.	NA	
116100	ID ELEV	0	-		-	NORTHING:			ft (NAD83			-		US ft (NAD83)		22.0	_
	DEPTH			1			1 D 1586-08a;						ROD TYPE: AW	1	ID):140-lb. A		C-4
	V. DEPTH BLOW COUNT					ED: 9/24/09	HOLE DIA.:	3"	CASING	- In	H: 82	.1 ft	CORE SIZE: N	IQ3 BITS US	ED: 2-7/8" Tr	ri-Cone	_
	(ft) 0.5ft 0.5ft 0.5ft				0		VS PER FOOT	80	7.60	MP.		0	SC	LAND ROCK D	ESCRIPTION	Ê.	
(ft)			0	20 4	0 60	80	100 N	10.	MOI	G					-		
231.4	1	1				Continued	from previous	page	e								
1	38 62/0.3			1.1			1 1 1		5-14		2		ERED ROCK: Se Z BIOTITE GNEI				
+				*****		* * *			1	2	SAND (S	SM), reddish yello	w (7.5YR 6/6)) to light			
227.1	50/0.2		11	*****			50/0.2 5	5-15		27	fine to m	h brown (2.5Y 6/3 hedium grained sa	and, little mica	, trace			
+			123								quartz ro	ock fragments) (c	ontinued)				
22.1				-	*****						3	221.9		-			
					2. 1			+	50/0.2	5-16	11.1		HARD F	ROCK: Dark gray	with orange st	taining,	- 1
+					1.1	******						110	very clos	se to close fractur	ring, medium h		
1					1.								hard, QU	JARTZ BIOTITE	GNEISS		
1					1.4	******							- 214.3				
t					1.			* * *	4 - 4		111	11	HARD F	ROCK: Light to da moderately weat	rk gray with or	range	
1						* * * * * * *	* * * * * * * *	* *	* * *			112	moderat	elv close fracturir	ng, moderately		
+					1.5	*****						\$\$\$F	QUART	Z BIOTITE GNEI	55		
1					1.1								3				
+					- 1	*****						***					
+													5				
1												11					
1	2				1.5	******					1111		- 199.3				
1					1.5	*****			· · · · ·		***		HARD F	ROCK: Dark gray,	moderately to	o very	-
+									1.5.7			11/2	close fra	weathered, very c acturing, hard, QL	JARTZ BIOTIT	TE	
1	-					******		1 +					GNEISS				
-																	
1												***					
+																	
1								1.				11/2					
1						* * * * * * *							-				
+								11									
+	-				8 4	1.1.1.1.1.1)))}					
-	2										1.00		-				
+					- 1								3				
1					- ,												
-	2				1.			11				11/2	5				
1					* *		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1.1									
Ŧ	3					211115		: :	100								
-					* *							M		ROCK: Dark gray		evere to	1
1													slightly	weathered, very o ig, medium hard l	lose to close		
1								1.1						E GNEISS	in the of second	12	1
1					0.0		******	1.1	* E (1.54) * E (1.54)				HARD F	ROCK: Dark gray		rd	-
-								11	1.172					ed, close to wide Z BIOTITE GNE		id,	
-	-							÷ 1					-				
		1	1	1	1												



SHEET 3 OF 3

		0-011	VO.: 25	101		INFIGIE O	PRC	JECT NO .:	6468	-09-24/3	C	JOUNT	. L	ouisa, VA	GLULUGIOT.	C. Baldwin	
SITE D	DESCRIP				rojec	t Suppleme					_		_	Pitts/J. Tucker		FLUID L	EVEL (ft)
	IG NO.:						_	DD: Mud Ro	tarv/F	Rock Co			-	HINE: CME-55 1		0 HR.	NA
	ND ELEV		6.2 ft	(NAV	088)		_	3,909,775	_			_			US ft (NAD8	-	22.0
	DEPTH							D 1586-08a;						ROD TYPE: AN		R (ID):140-Ib.	
				-		ED: 9/24/09		HOLE DIA.:	-					t CORE SIZE:			
	DEPTH	_	DW CO	-	LCIE		_	PER FOOT	3		SAMP	1		GORE SIZE.	NG3 DI 3 0	SED. 2-110 1	II-Cone
ELEV.	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	NO.	1	0	5	OIL AND ROCK	DESCRIPTION	1
(ft)	(11)	0.511	0.51	U.SIL	T	T	T	- T	-		NO.	MOI	G				
56.6						Continue	d fro	om previous	page		-	-					
	±				1.1					* * *				154.3			1
	1												111		and coring term	nated at 151.9	
							1							Boring	closed by tremie t-bentonite grout	e method with	



SHEET 1 OF 1

							1 01 1		
BECHTEL PROJECT NO .: 251	61	MACTEC PR	OJECT NO .:	6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST: C	C. Baldwin		
SITE DESCRIPTION: North Ar	na 3 Projec	t Supplement	2		DRILLER: P. Pitts/J. Tuck	ker	FLUID L	EVEL (ft)	
BORING NO .: M-17		DRILL METH	OD: Mud Rot	tary/Rock Core	DRILL MACHINE: CME-5	5 Trailer (RAL)	0 HR.	NA	
GROUND ELEV .: 306.2 ft	(NAVD88)	NORTHING:	3,909,775	US ft (NAD83)	EASTING: 11,686,214	US ft (NAD83)	24 HR.	22.0	
TOTAL DEPTH: 151.9 ft	SAMPLE	METHODS: AS	STM D 1586-	08a; 2488-09a; 2	113-08; 6032-08	HAMMER (ID):	140-lb. Auto ((MEC-425)	
ATE STARTED: 9/21/09 COMPLETED: 9/24/09 CASING DEPTH: 82.				DEPTH: 82.1 ft	1 ft CORE BARREL TYPE: Wireline NQ3 Triple Tube, serie				
DATE STARTED: 9/21/09	TED: 9/24/09	CASING	DEPTH: 02.1 IL	CORE DARKEL TIPE: W	irenne wwo imple i	upe, series 6	DIT		

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	LOG	DESCRIPTION AND REMARKS	_
					*					Begin Coring @ 84.3 ft	
221.9 219.3	84.3 86.9	2.6	3:45/0.6 5:30 12:53	(2.6) 100%	(2.0) 77%	RUN 1	(5.6) 74%	(3.7) 49%		221.9 HARD ROCK: Dark gray with orange staining, moderately severe to moderate weathered, very close to close fracturing, medium hard to hard, QUARTZ	ly 84
		5.0	5:00 3:57 6:20	(3.0) 60%	(1.7) 34%	RUN 2				BIOTITE GNEISS (2 joints at 0°, open with clay; 2 joints at 50°, tight with trace clay) (2 joints at 0°, tight; 3 joints at 30°, tight)	
214.3	91.9		10:20 5:11							214.3	91.
		5.0	5:45 3:42 3:30 3:13	(5.0) 100%	(3.1) 62%	RUN 3	(14.5) 97%	(11.4) 76%		HARD ROCK: Light to dark gray with orange staining, moderately weathered, very close to moderately close fracturing, moderately hard, QUARTZ BIOTITE GNEISS (3 joints at 10°, tight to open; 7 joints at 30-40°, tight, 1 joint at 60°, tight)	
209.3	96.9	5.0	5:15	(4.5)	(3;3)	RUN 4			\gg	(3 joints at 30-40°, tight 6 joints at 60-70°, tight to open)	
204.3	101.9	5.0	3:20 3:43 2:40 3:22	90%	66%	1014.4				(o jointa at 50% , agint, o jointa at 60% o , agint to open)	
204.0	101.8	5.0	3:20 3:05 3:29 2:55	(5.0) 100%	(5.0) 100%	RUN 5				(1 joint at 20°, tight; 2 joints at 40°, tight)	
199.3	106,9		3:40						$\geq \geq \geq$	-199.3	106
194.3	111.9	5.0	3:32 3:05 2:48 2:46 2:38	(5.0) 100%	(4.7) 94%	RUN 6	(30.0) 100%	(27.9) 93%		HARD ROCK: Dark gray, moderately to very slightly weathered, very close to moderately close fracturing, hard, QUARTZ BIOTITE GNEISS (2 joints at 20°, light; 1 joint at 40°, tight)	
194.5	111.9	5.0	3:30	(5.0)	(3.7)	RUN 7				(1 joint at 0°, tight; 1 joint at 20°, tight; 8 joints at 40-50°, tight)	
189.3	116.9		3:23 3:50 3:35 4:00	100%	74%						
109.3	110.9	5.0	3:55	(5.0)	(4.5)	RUN 8				(4 joints at 30°, tight)	
184.3	121,9		3:15 3:57 3:05 2:30	100%	90%						
		5.0	3:12 3:57 2:40 2:54	(5.0) 100%	(5.0) 100%	RUN 9				(1 joint at 60°, tight)	
179.3	126.9	50	3:12 3:00	15.01	15.01	RUN 10				Zd later at 40° (inter)	
		5.0	3:00 3:04 2:55 2:52	(5.0) 100%	(5.0) 100%	RUN 10				(1 joint at 40°, tight)	
174.3	131.9	5.0	2:31	(5.0)	(5.0)	RUN 11			VII	(2 joints at 50°, tight)	
		0.0	3:00 3:08 3:17	100%	100%	incir in					
169.3	136.9	5.0	2:56 3:18	(3.5)	(2.0)	RUN 12	(3.5)	(2.0)	SH	169.3 HARD ROCK: Dark gray, moderately severe to slightly weathered, very close	136 to
			2:32 1:00 2:39	70%	40%		70%	40%		close fracturing, medium hard to hard, QUARTZ BIOTITE GNEISS (2 joints at 30°, light; 2 joints at 50°, tight)	
164,3	141.9	5.0	3:33 3:42	(5.0)	(5.0)	RUN 13	(10.0)	(10.0)	R	164.3 HARD ROCK: Dark gray, very slightly weathered, close to wide fracturing, ha	141 d,
100 0	146.9		3:41 3:20 3:00 2:05	100%	100%		100%	100%		QUARTZ BIOTITE GNEISS (1 joint at 30°, tight; 1 joint at 70°, tight)	
159.3	140.9	5.0	2:57 3:20 2:53	(5.0) 100%	(5.0) 100%	RUN 14				(No Joints)	
154.3	151.9		2:50 2:24						111	-154.3	151
104.0	101.9		S. IA.	1					111	Boring and coring terminated at 151.9 feet.	7.81
										Boring closed by tremie method with cement-bentonite grout.	

DCN NAP307

North Anna 3 Project MACTEC Project No. 6468-09-2473



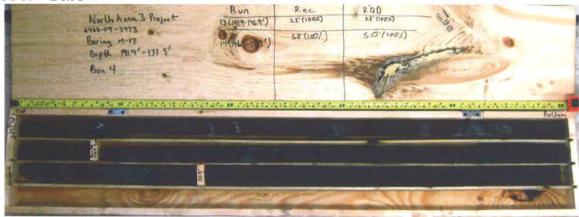
M-17 - Box 1

W 10 1 2 0	Run (\$1)	her.	1 RQ0		
North Anna 3 Project 6468-09-2473	5 (101.1- 106.9- 106.9)	3.0' (1+07.)	3.0' (100%)		
Boring M-17	L(1064'-111.4')	5.0' (1007.)	47' :(947.)		
Andrait Depth 105.7 - 1232	7 (009-06.91)	5.0 (100%)	3.7" (717.)		-
and the second se	\$ (065-m.9')	5.0" (100%.)	4.5' (402)		
Box 2 Run 4 conte	9 (mig-126.91)	5.0'(1007.1	5.0'(1002)		
Box 2 Run 4 cente inter 3		and a second sec			
A CONTRACTOR OF A CONTRACTOR O			1 .		
111					
		No. of Lot of Lo	1	-	
		and the second second	¢		
	-	Varia -			
	11 pla 11-			SLAN	
	S 3. 4 .	and the second se		1910	
and the second se			-		
State of the second second second second second second second second second second second second second second			Mi		Net

M-17 - Box 2

North Anna 3 Project	Run	K	1 RSD		
\$6168-09-2473	contin 9 (11.5.116.8)	5.0"(1007.)	5.0.(600%)	51	
Borly M-17	Box 2 10(146.4-131.4')	5.0' (1002)	3.0' (1002)	01	
Depth 123.7-141.9	11 (1314-1364')	5.0 (1007.)	5 0'(100/.)		
Box 3	12 (134.5'- 141.5')	3.5 (664	1.8' (36/)		in the second
Company and an interest of the	13-(1919-196.4)		-		
and the second sec	alphiles .				
Production of Production Productions	1 of statute at fists	delete the second second	a second states	and a fair of the	ta ta da da ata ta da 🕈 🗖
		and the second se			Constant Statements
1				12	4
		Auger as	× 1	17	
	+ +	tote -		24	416
	Contraction of the local division of the loc	1		100	
					10
			100		
STATISTICS IN CONTRACTOR OF A DESCRIPTION OF A DESCRIPANTE A DESCRIPANTE A DESCRIPANTE A DESCRIPTION OF A DE				1000 C	Cattore

M-17 - Box 3



M-17 - Box 4



Prepared By JJJ Date /2/16/09

Checked By Man Date 12/16/09

BECHT	EL PRU	JECT	NO.: 25	161		WAGTECP	ROJECT NO .:	0400	-03-2413		JOUNTI	·	ouisa, VA GEO	LOGIST: B	. Mable	_	_
SITE DE	SCRIP	TION: N	North A	nna 3 F	rojec	ct Suppleme	nt 2			1	DRILLEF	R: D.	. Rhodes/K. Guy		FLUID L	EVEL (ft)	
BORING	G NO.:	M-18				DRILL MET	HOD: Mud Ro	tary		1	DRILL M	ACH	HINE: CME-45C Trac	k (RAL)	0 HR.	16.0	
GROUN	D ELE	.: 304	1.2 ft	(NAV	D88)	NORTHING	: 3,909,608	US	ft (NAD	83) E	EASTING	G: 1	11,686,214 US	ft (NAD83)	24 HR.	NA	
TOTAL	DEPTH	60.4	ft S	AMPLE	MET	HODS: AST	M D 1586-08a;	2488	-09a; 21	13-08	8; 6032-0	8	ROD TYPE: AWJ	HAMMER (I	D):140-lb.	Auto (MEC	-1
DATE S	TARTE	D: 9/2	9/09	COM	PLET	ED: 9/29/09	HOLE DIA.	: 3"	CASIN	G DE	PTH: 9.	0 ft	CORE SIZE: NA	BITS USE	D: 2-7/8" T	ri-Cone	
ELEV.	DEPTH	BLC	ow cou	UNT			WS PER FOOT			SAM	· 🗸	LO	SOILA	ND ROCK DE	SCRIPTION	i .	
(ft)	(ft)	0.5ft	0,5ft	0.5ft	0	20	40 60	80	100	NO.	MOI	100					_
304.2	-		_			Gr	ound Surface				1		304.2				(
+								1.5.3	4.1.1					from 0.0 to 8 toe by Domini			
+									2.1.2				-				
+									4 - 4				-				
‡							*******						F.				
295.5 -	-	2	2	2					111	SS-1	-		RESIDUAL S	SOIL: SILT (M	IL), strong br	own	8
293.5 -	10.7	2	1	3	I			1.03	+ 0.0	SS-2	3		 (7.5YR 4/6), and black sta 	soft, moist, fe aining, relict ro	w mica, dark	brown	
291.4 +	12.8	2	2	2	I			1		SS-3	=		-				
288.9	15.3				1.1	** * * * * * * *	*******	+ + + + + + + + + + + + + + + + + + + +		55-4			-	1100			
1		1	2	3		5				55-4			15.3 ft: Medi	um stiff			
285.7	18.5	2	2	3		 	*******	* * *	101	SS-5			- 18.5 ft: Pale	Yellow (2.5Y	7/4)		
+					-1		******	122	231				283.2	SOIL: Elastic		allow	2
280.7	23.5								* * *				(2.5Y 7/6), m	nedium stiff, m	noist, trace m	ica,	
1		2	3	4		Ż	* * * * * * * *	* * *	1.00.00	SS-6			orange and t	brown staining	, relict rock t	abric	
t					* *		*******										
275.7	28.5	2	3	3		******	******	* * *		SS-7	-		28.5 ft: Olive	yellow (2.5Y	6/6)		
+		-				16. 		1 	111			Ш		,			
270.7	33.5								1.0								
-	-	2	3	4	1:1	7	* * * * * * * *		111	SS-8			- 33.5 ft: Light mica	yellowish bro	wn (2.5Y 6/4), little	
Ŧ					- 1	******	******		1 2 2 2								
265.7	38.5	2	1	2	-/			: : :		SS-9	-	Ш	38.5 ft: Soft				
Ŧ		2		2					: : : :		-	Ш	262.2				
260.7	43.5		-				******	• • •					RESIDUAL	SOIL: Silty SA	ND (SM), str	ong	4
200.7 -	- 40.0	3	6	6	1	12				SS-10	5		brown (7.5Y	R 5/6), mediu ained sand, tra	m dense, mo	ist, fine	
Ŧ	-					1	******		0				fabric				
255.7	48.5	-	0			[· · · · · ·				SS-11	_		19 E ft: Prou	nish yellow (1	OVD GIAL IN		
1		5	3	4	- 1	7	******				-		40.0 IL BIOW	mistryenow (1	WTR 0/4), 100	36	
250 7	E9.5												RESIDUAL	SOIL: Sandy S	SILT (ML), st	rong	5
250.7	- 53.5	4	5	6	8.8	-		999		SS-13	2			R 5/6), stiff, m			
+										-			247.2	-			5
245.7	58.5		00.0				<u> </u>	-		00.44	_	2	WEATHERE	D ROCK: Se			-
244.0	60.2	78 50/0.2	22/0.1		~ *				100/0.8	SS-1	_	K	243.8 SAND (SM),	brownish yell	ow (10YR 6/	4), very	6
+		50/0.2							50/0.2				(trace mica)				
4	1												-	nated at 60.4			
+	1												 Boring close cement-bent 	d by tremie m tonite grout.	ethod with		
+													-	uid level beca	use boring a	routed	
1													same day bo				
1													L				



GEOTECHNICAL BORING LOG Prepared By JJJ Date 12/16/05

Checked By MM Date 12/16/09

BECHT	EL PRU	JECT	10.: 25	161	MACTEC	PROJECT	0.: 6468	-09-2473	C	OUNTY	: L	ouisa, VA GEO	LOGIST: A	. Mwembeshi	
SITE DE	SCRIP	TION: N	North A	nna 3 P	roject Suppleme	ent 2			D	RILLER	: R.	Landeros/D. Reneat	u	FLUID LEVEL	(ft)
ORING	G NO.:	M-19			DRILL ME	THOD: Mud	Rotary/	Rock Cor	e D	RILL M	ACH	HINE: CME-550X (ATI	L)	0 HR.	NA
ROUN	D ELEN	/.: 280).4 ft	(NAV	D88) NORTHIN	G: 3,910,0	53 US	ft (NAD	33) E	ASTING	i: 1	11,685,856 US	ft (NAD83)	24 HR. 1	9.0
OTAL	DEPTH	: 151.4	tft S	AMPLE	METHODS: AS	TM D 1586-	08a; 2488	-09a; 21	3-08	; 6032-0	8	ROD TYPE: AWJ	HAMMER (I	D):140-lb. Auto (I	MEC-0
ATE S	TARTE	D: 9/2	3/09	COMF	LETED: 9/29/09	HOLE	DIA.: 3"	CASIN	G DE	PTH: 66	.5 ft	CORE SIZE: NQ3	1	D: 2-7/8" Tri-Con	
LEV.	DEPTH	BLC	ow cou	JNT	BLC	OWS PER FO	TOC		SAMP	. V/	L				-
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 20	40 60	80	100	NO.	MOI	0 G	SOIL A	ND ROCK DI	ESCRIPTION	
														~~~~~	
280.4	-	-	-		G	round Surfa	ice			+	11	280.4 No sampling	from 0.0 to 9	.8 feet due to soft di	a
+												utility clearan			0
+												-			
+							****								
t			2000				$\frac{1}{2} + \frac{1}{2} + \frac{1}$					È			
270.6	9.8	4	2	2			* * * * *		SS-1			- 270.6		ND (SM), brownish	
268.1	12.3	4	2					111	_	-		yellow (10YR	6/6), very loc	ose, moist, fine to	
-	1	2	1	3	•4		****		SS-2			coarse graine 12.5 ft: Wet	ed sand, relic	t rock fabric	
265.6 -	- 14.8	2	2	3			****		SS-3			14.8 ft: Very ;	pale brown (1	0YR 7/3), loose	
262.1	18.3											-			
	10.0	3	2	2				+ +	SS-4			18.5 ft: Very I	oose		
+												-			
257.1	23.3						* * * * *								
1		3	3	4	7		****	1.1	SS-5	-		23.3 ft: Very p moist	pale brown (1	0YR 7/4), loose,	
Ŧ												-			
252.1	28.3	3	4	6			* * * *		SS-6	-		28.3 ft: Light	brownish ara	y (10YR 6/2), little	
4					10				-			mica		, (	
247.1	33.3		1.0												
1	00.0	4	5	8	• • • 13				SS-7			33.3 ft: Very dense	pale brown (1	0YR 7/3), medium	
+												dense			
242.1	38.3	-		10					SS-8			20.2.0.1	kana kana kana		
1		6	7	10	17				22-0	-		38.3 π: Light medium grain		y (10YR 6/2), fine to ce mica	
+	-					******	****								
237.1	43.3	7	10	15	25				SS-9	- 1				0YR 7/3), fine to	
+	-					 		· · · · ·				coarse graine fragments	ed sand, few	quartz rock	
232.1	48.3		-				****								
Ŧ		10	13	17					SS-10			48.3 ft: Very	pale brown (1	10YR 7/4)	
7												-			
227.1	53.3	10	12	15			* * * *		SS-11	-					
+	-	15		10	•27					-		-			
222.1	- 58.3		·			1						F			
-		19	25	31					SS-12			58.3 ft: Very	dense, little n	nica	
+						/						-			
217.1	63.3	-			1 + + + + + + + + + + + + + + + + + + +				00.10						
-	-	21	28	37			65		SS-13			-			
1	-						1	4 4 4 4 4 4 1 4				HARD ROCK	C Light gray	and brown	1
212.1	68.3	22	50/0.3				* * * *		SS-14			moderately w	veathered to t	fresh, very close to	
4								50/0.3				<ul> <li>hard, BIOTIT</li> </ul>	E QUARTZ (	g, moderately hard I GNEISS with zones	0
+								1000		1 1	>>>>	of WEATHER	RED ROCK:	BIOTITE QUARTZ	



SHEET 2 OF 3

BECHT	TEL PRO	JECT N	10.: 25	161		MACTEC PR	OJECT NO .:	6468	-09-2473	C	OUNT	/: L	Louisa, VA GEOLOGIST: A. Mwembeshi
SITE D	ESCRIPT	ION: N	lorth A	Anna 3 P	rojec	t Supplement	2			D	RILLER	R: R.	R. Landeros/D. Reneau FLUID LEVEL (ft)
	IG NO.:	_					IOD: Mud Ro	tary/I	Rock Con	D	RILL M	ACH	CHINE: CME-550X (ATL) 0 HR. NA
	ND ELEV.		4.00	(NAV		NORTHING:		_		-		_	11,685,856 US ft (NAD83) 24 HR. 19.0
_	DEPTH:		-				D 1586-08a;	_		1		-	ROD TYPE: AWJ HAMMER (ID):140-Ib. Auto (MEC-
_	_			-	_		1	_		_		-	
	STARTED				LETE	D: 9/29/09	HOLE DIA .:	3.			1	5.5 f	ft CORE SIZE: NQ3 BITS USED: 2-7/8" Tri-Cone
	DEPTH		ow co				/S PER FOOT	00		AMP.	1	ō	
(ft)	(ft)	0,5ft	0.5ft	0.5ft	0	20 40		80	100	NO.	MOI	G	
					1								
205.6					*	Continued f	rom previous	page	e				
-	t		-			 			4 4 1				
	f				1.1		******					Ille	202.0
-	F				-								HARD ROCK: Light gray and light brownish
	t I											111	gray, slightly weathered to fresh, very close to wide fracturing, moderately hard to hard,
-	t I							* * *					BIOTITE QUARTZ GNEISS
	Į I						*****		+ + +			111	Ŧ
-	t I						*****		4.4.4				
	+											111	
	‡												¥.
-					0 m. 10 m.	* * * * * * * *	******		* * *			111	t l
-	F												
1	±				2.4				2 = 4		1 3		t l
-	+				* *	*******	*****						
	‡				1.0	* * * * * * *							4
	+					 						$\langle \rangle \rangle$	
-	F												4
	t I				-0-5								
-	+						******						4
-	I I						*****						
-	±					* * * * * * * *							E Contraction of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se
	Ŧ I						* * * * * *	10 A. A				<i>M</i>	
1	± I												E.
	+					* * * * * * * * *	* * * * * * *					<i>[]]</i>	
	‡				1.4								T.
	+					* * * * * * * *						UII.	
	Į.						******					111	+
1	t I						******					III,	X.
	+						******					111	1 Alexandread
1	Ŧ I				3.14	* * * * * * *						MII.	¥.
	t					* * * * * * * *						111	t
	Į I							• • •					₩.
1	±												
	+						* * * * * * *		1.1.1			<i>[[]]</i>	
1	‡					*******							
	+											011	*
	Ŧ											111	A.
	t I											111	×.
-	+					* * * * * * * *	*****					111	-
1	1				• •	******			3.7.5			MI,	英
1	+					* * * * * * * *						111	7
1	Į I												×.
	t				* *	******						111	
	+								1.7.7			000	
1	İ.					*******	*****					111	A-
	+				1.1			1. 1. 1	0 1 8 9			111	×
								1 Call 1	1 A 14 A			Ulli	



ECHI	TEL PRO	JECT	NO.: 25	161		MACTEC PR	ROJECT NO .:	6468	-09-2473	C	OUNT	1: L	ouisa, VA GEOLOGIST: A. Mwembeshi
ITE D	ESCRIP	TION:	North A	Anna 3 F	rojec	ct Supplemen	t 2			D	RILLER	R: R.	L Landeros/D. Reneau FLUID LEVEL (ft)
ORIN	G NO.:	M-19				DRILL METH	OD: Mud Ro	tary/F	Rock Core	D	RILL M	ACH	HINE: CME-550X (ATL) 0 HR. NA
ROU	ND ELE	V.: 28	0.4 ft	(NAV	D88)	NORTHING:	3,910,053	US	ft (NAD8:	3) E/	ASTIN	G: *	11,685,856 US ft (NAD83) 24 HR. 19.0
OTAL	DEPTH	: 151.	4 ft S	SAMPLE	MET	THODS: ASTN	D 1586-08a;	2488	-09a; 211:	-08;	6032-0	80	ROD TYPE: AWJ HAMMER (ID): 140-Ib. Auto (MEC-
ATE	STARTE	D: 9/2	3/09	COM	PLET	ED: 9/29/09	HOLE DIA.	3"	CASING	DEP	TH: 66	5.5 ft	t CORE SIZE: NQ3 BITS USED: 2-7/8" Tri-Cone
LEV.	DEPTH	BL	ow co	UNT		BLOV	VS PER FOOT		S	AMP.	V/	LO	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20 4	0 60	80	100	NO.	MOI		SOIL AND ROCK DESCRIPTION
30.8						Continued	from previous	nane					
- 30.0	-	-	-		10	Contanded	ion previous	page	***	-		111	129.0 11
	-	-										2222	Boring and coring terminated at 151.4 feet.
-	1												Boring closed by tremie method with
÷	1												cement-bentonite grout.
													<ul> <li>24 hour water level measured on 9/29/2009</li> <li>prior to drilling. Borehole was at a depth of 138.6 feet.</li> </ul>
	-												<ul> <li>NOTE: Began coring at 66.6 ft after boring was</li> </ul>
	÷												<ul> <li>advanced by mud rotary to 73.0 ft and casing</li> <li>was set at 66.5 ft. SPT sample SS-14</li> </ul>
-	F												Collected at 68.3 ft indicates the roller cone had "walked off" along a weathered fracture zone.
-	F												as well as difficulty noted by rig geologist advancing SPT sampler to 73.0 ft for SS-15.
1	‡												Core recovery of HARD ROCK from 66.6 ft to 78.4 was 100%, with weathering noted along
	-												fractures/joints supporting this conclusion.
-	+				1								
1	-												
	t												
	1			Ť.									t
-	t												
	F												
	Ŧ				1								
	Ŧ										1		F
	ŧ			8									F
-	‡												-
	+												1
	ŧ.												1
1	t												<b>T</b>
	İ												E .
	+												
-	Ŧ												F
	Ŧ												E.
	‡												
	ţ.												-
	‡												
-	t		1										E.
	t												
	F												-
													-
	‡												
-	t												
	t												t .
	1												-



SHEET 1 OF 2

BECHTEL PROJECT NO.: 2516	1	MACTEC PRO	JECT NO .:	6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST:	A. Mwembeshi	
SITE DESCRIPTION: North Ann	na 3 Projec	t Supplement 2	2		DRILLER: R. Landeros/D. I	Reneau	FLUID LE	EVEL (ft)
BORING NO .: M-19		DRILL METHO	D: Mud Rot	ary/Rock Core	DRILL MACHINE: CME-550	X (ATL)	0 HR.	NA
GROUND ELEV .: 280.4 ft	(NAVD88)	NORTHING:	3,910,053	US ft (NAD83)	EASTING: 11,685,856	US ft (NAD83)	24 HR.	19.0
TOTAL DEPTH: 151.4 ft	SAMPLE	METHODS: AS	TM D 1586-0	)8a; 2488-09a; 2	113-08; 6032-08	HAMMER (ID):	140-lb. Auto (	MEC-05)
DATE STARTED: 9/23/09	COMPLE	TED: 9/29/09	CASING D	DEPTH: 66.5 ft	CORE BARREL TYPE: Wir	eline NQ3 Triple	Tube, series 6	& 10 bits

ł		DEDTU	DUN	DRILL	RL		CAMP	STR		L			۲
	ELEV. (ft)	DEPTH (ft)	RUN (ft)	RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	0 G		DESCRIPTION AND REMARKS	
						•						Begin Coring @ 66.6 ft	
	213.8 211.7	66.6 68.7	2.1 5.0	4:22/1.1 3:37 N=50/0.3 2:23 2:11 2:32	(2.1) 100% (5.0) 100%	(2.1) 100% (3.9) 78%	RUN 1 	(11.8) 100%			213.8	HARD ROCK: Light gray and brown, moderately weathered to fresh, very close to moderately close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS with zones of WEATHERED ROCK: BIOTITE QUARTZ GNEISS (1 joint at 0°, open with orange staining; 1 joint at 45°, open with orange staining)	.0
	206.7	73.7	4.7	2:38 2:41 N=50/0.0	(4.7)	(4.7)	SS-15 RUN 3				-	(12 joints at 15-45°, open, moderately weathered with trace orange staining) Note: Recovered 0.5 ft of RUN 1 with RUN 2 (3 joints at 15-30°, open with trace orange staining; 1 joint at 45°, open)	
	202.0	78.4		3:51 4:22 5:01 3:47	100%	100%					202.0	Note: Recovered 0.5 ft of RUN 2 with RUN 3	5.4
			5.0	5:02/0.7 4:40 6:01 6:26 3:56	(5.0) 100%	(3.8) 76%	RUN 4	(73.0) 100%	(70.1) 96%		-	HARD ROCK: Light gray and light brownish gray, slightly weathered to fresh, very close to wide fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS (7 joints at 15-45°, open with iron staining; 0.5 ft thick guartz vein at 80.7 feet)	
	197.0	83.4	5.1	4:02 4:15	(5.1)	(4.5)	RUN 5			$\gg$	_	(9 joints at 30-45°, open with orange staining; 2 joints at 75°, open)	
	191,9	88.5		4:23 4:45 4:51 7:02/1.1	100%	88%					-		
	186.8	93.6	5.1	3:23 3:28 3:39 3:32 3:41/1.1	(5.1) 100%	(5.1) 100%	RUN 6				-	(2 joints at 45°, open; 2 joints at 75°, open)	
			5.0	3:37 2:12 2:11 2:28	(5.0) 100%	(4.6) 92%	RUN 7				-	(2 joints at 30-45°, open; 0.5 ft thick quartz vein from 93.6-94.1 feet)	
	181.8	98.6	5.0	2:31 2:39 3:17 3:55 3:48	(5.0) 100%	(5.0) 100%	RUN 8				-	(3 joints at 30-40°, tight)	
	176.8	103.6	5.0	4:09 4:27 7:28 4:58 5:20	(5.0) 100%	(5.0) 100%	RUN 9				-	(1 joint at 45°, tight)	
NORTH ANNA 3.GDT 12/3/09	171.8	108.6	5.0	5:23 3:20 2:45 3:58	(5.0) 100%	(5.0) 100%	RUN 10	-			-	(No Joints) Note: Recovered 0.1 ft of RUN 9 with RUN 10	
I ANNA 3.0	166.8	113.6	5.0	3:44 4:08 3:38 4:10	(5.0) 100%	(4.9) 98%	RUN 11	-			-	(2 joints at 45°, tight with trace orange staining)	
NORTH	161.8	118,6	5.0	4:05 3:58 4:20 2:25	(5.0)	(5.0)	RUN 12	-			-	(No Joints)	
JECT.GPJ	156.8	123.6	0.0	3:02 3:55 3:45 4:02	100%	100%					-	Note: Recovered 0.2 ft of RUN 11 with RUN 12	
NNA 3 PRC			5.0	4:08 6:15 6:01 6:34	(5.0) 100%	(5.0) 100%	RUN 13					(No Joints)	
E NORTH A	151.8	128.6	5.0	6:45 7:22 7:20 3:49 4:28	(5.0) 100%	(5.0) 100%	RUN 14	-			-	(No Joints)	
NORTH ANNA 3 CORE NORTH ANNA 3 PROJEC	146.8	133.6	5.0	4:57 3:00 1:55 1:59 2:46	(5.0) 100%	(5.0) 100%	RUN 15	-			-	(3 joints at 45-60°, tight)	
NORTH AI	141.8	138.6	5.0	2:57 2:31 2:37 3:05	(5.0) 100%	(4.4) 88%	RUN 16				-	(8 joints at 30-45°, open with orange and black staining; 1 joint at 75°, open with orange and black staining; 0.2 ft thick quartz vein at 141.0 feet)	

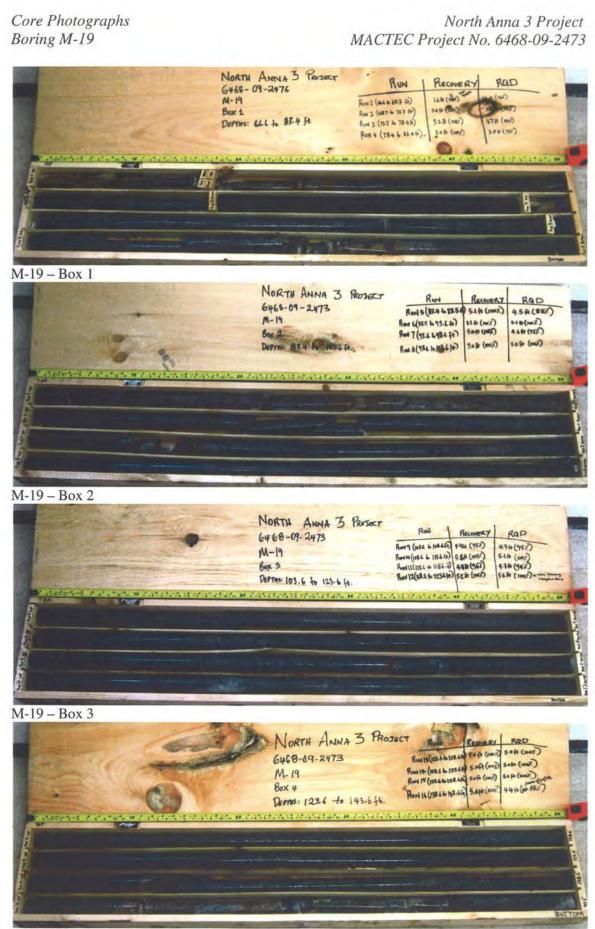
Volume 1, Revision 0



SHEET 2 OF 2

BECHTEL PROJECT NO .: 2516	51	MACTEC	PROJEC	T NO.:	6468-09-2473	COUNTY:	Louisa, VA	GEOLOGIST:	A. Mwembesh	i
SITE DESCRIPTION: North An	na 3 Projec	t Supplem	ent 2			DRILLER:	R. Landeros/D. I	Reneau	FLUID L	EVEL (ft)
BORING NO .: M-19		DRILL ME	THOD: N	Jud Rot	ary/Rock Core	DRILL MAG	CHINE: CME-550	X (ATL)	0 HR.	NA
GROUND ELEV .: 280.4 ft	(NAVD88)	NORTHIN	G: 3,91	10,053	US ft (NAD83)	EASTING:	11,685,856	US ft (NAD83)	24 HR.	19.0
TOTAL DEPTH: 151.4 ft	SAMPLE	METHODS	: ASTM [	D 1586-0	08a; 2488-09a; 2	113-08; 6032	2-08	HAMMER (ID):	: 140-lb. Auto	(MEC-05)
DATE STARTED: 9/23/09	COMPLE	TED: 9/29/	09 CA	ASING [	DEPTH: 66.5 ft	CORE BAR	REL TYPE: Wir	eline NQ3 Triple	Tube, series 6	& 10 bits
ELEV. DEPTH RUN RATE (ft) (ft) (ft) (ft)	REC. RQ (ft) (ft		STRAT REC. F (ft)	RQD O			DESCRIPTION	AND REMARKS		

	(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	G		DESCRIPTION AND REMARKS	
ſ												Continued from provinus page	
ŀ				4:26								Continued from previous page HARD ROCK: Light gray and light brownish gray, slightly weathered to fresh,	
	136.8	143.6		4:49						$\gg$	F	very close to wide fracturing, moderately hard to hard, BIOTITE QUARTZ	
			5.0	4:38 5:34	(5.0)	(5.0) 100%	RUN 17			$\mathbb{K}$	-	GNEISS <i>(continued)</i> (2 joints at 45°, open with trace clay)	
				4:12 2:21	10070	10070				$\gg$	+	(-)	
L	131.8	148.6		2:35						***	t i		
			2.8	2:43 3:13	(2.8)	(2.8) 100%	RUN 18			$\gg$	-	(1 joint at 60°, open with trace clay)	
ŀ	129.0	151.4		3:10/0.8	100 %	100 %				KKK	129.0	Boring and coring terminated at 151.4 feet.	151.4
											E		
											-	Boring closed by tremie method with cement-bentonite grout.	
											-	24 hour water level measured on 9/29/2009 prior to drilling. Borehole was at a depth of 138.6 feet.	
											E	NOTE: Began coring at 66.6 ft after boring was advanced by mud rotary to 73.0	
											-	ft and casing was set at 66.5 ft. SPT sample SS-14 collected at 68.3 ft indicates the roller cone had "walked off" along a weathered fracture zone, as well as difficulty noted by rig geologist advancing SPT sampler to 73.0 ft for SS-15. Core recovery of HARD ROCK from 66.6 ft to 78.4 was 100%, with	
											-	weathering noted along fractures/joints supporting this conclusion.	
											-		
											-		
											_		
											F		
											F		
											F		
											-		
											-		
											E		
60/8											-		
12/3											-		
DT											-		
13.0											-		
NN											-		
H H											E		
ORI											F		
N											-		
T.GI											-		
JEC											F		
PRO											E .		
A 3							2				-		
ANN											F		
HT /											E		
NOR											E		
RE ]											-		
CO											Ē		
VA 3											E		
NORTH ANNA 3 CORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/3/09											F		
HIN											E.		
NOF											-		



M-19 - Box 4

Core PhotographsNorth Anna 3 ProjectBoring M-19MACTEC Project No. 6468-09-2473



M-19 - Box 5



GEOTECHNICAL BORING LOG Prepared By JSJ Date 12/16/09

Checked By MRL Date 12/16/09

BECHT	EL PRC	JECT	NO.: 25	161		MACTEC PR	OJECT NO .:	6468-	09-2473	(	COUNTY	t: L	ouisa, VA GEOLOGIST: B. Mabie	_
SITE D	ESCRIP	TION: I	North A	nna 3 F	Projec	ct Supplement	2			1	DRILLER	R: D.	. Rhodes/K. Guy FLUID LEVE	L (ft)
BORIN	G NO .:	M-20				DRILL METH	IOD: Mud Ro	otary/F	Rock Con	e [	DRILL M	ACH	HINE: CME-45C Track (RAL) 0 HR.	NA
GROUN	ND ELEN	/.: 302	2.6 ft	(NAV	D88)	NORTHING:	3,909,794	US	ft (NAD8	3) E	EASTING	G: *	11,686,068 US ft (NAD83) 24 HR.	15.5
OTAL	DEPTH	: 151.	oft S	AMPLE	MET	HODS: ASTM	D 1586-08a	: 2488	-09a; 211	3-08	3; 6032-0	08	ROD TYPE: AWJ HAMMER (ID):140-Ib. Auto	MEC-
	STARTE			1		ED: 9/25/09	HOLE DIA			_		-	t CORE SIZE: NQ3 BITS USED: 2-7/8" Tri-C	
	DEPTH	10.00	DW COL	1.4.6.10.	1	Contraction of the state of the	S PER FOOT			AMP	Inner A	L		
(稅)	(ft)	0.5ft	0.5ft	0.5ft	0	20 40		80	1.44	NO.		0	SOIL AND ROCK DESCRIPTION	
(14)	(14)	oton	Cient					1			VIVIOI	0	1	
302.6		-				Grou	und Surface	_	-				302.6	_
-						1.0.0.0.0	1 2 2 1 1 1 1		1				ASPHALT (Roadway) to 0.5 ft No sampling from 0.0 to 8.4 feet due to soft	dia
-	-												utility clearance by Dominion Personnel	1.0
-	-				**		4 + + 1 - 0 - +		1.1.1					
-	F				11			* * *	***				-	
294.2	8.4	6	5	8				* * *	1	SS-1	- 1	•	P 294.2 RESIDUAL SOIL: Well Graded SAND with	Silt
292.2	10.4	6	5	8		13				SS-2	-		(SW-SM), very pale brown (10YR 7/4),	2.04
-	- +0.4	0	þ	0		•13				002	-		medium dense, dry, fine to coarse grained sand, relict rock fabric	
289.2	13.4	5	6	9		15				5S-3		***	10.4 ft: Moist 287.7 13.4 ft: Light gray (10YR 7/2)	
-	E				21	1					-		RESIDUAL SOIL: Silty SAND (SM), very pa	le
284.1	18.5	-			0 i			* * *	111				<ul> <li>brown (10YR 7/3), medium dense, moist, fil</li> <li>to coarse grained sand, relict rock fabric</li> </ul>	ne
	- 10.0	7	7	7		•14 ····				SS-4				
	t							+ + 4						
279.1	23.5		1	-	4 + 	******	*****	1.1	* * 0 * * * *					
-	-	5	6	8	1	14				SS-5			23.5 ft: Wet, trace gravel sized rock fragme trace mica	nts,
1	Ē.				-00 - <del>1</del>			-						
274.1	28.5	-								0-				
-	+	13	16	20	1.1	36	5			SS-6			<ul> <li>28.5 ft: Light gray (10YR 7/2), dense, moist orange staining</li> </ul>	
-	-				1.1	11:1/11		* * *	* 1 X					
269.1	33.5	7	8	8		/				SS-7	-		33.5 ft: Gray (10YR 6/1), medium dense	
1	ţ.	1	0	0		16	1.3 1 + 1 +	-	· cat		-			
-	-					*******						5	WEATHERED ROCK: Severely weathered	
284.1	38.5	50/0.1			1 -	******			50/0.	SS-8		MAN AN	<u>263.7</u> BIOTITE QUARTZ GNEISS (Sampled as S	ilty
-	Į.	50/0.0			1.1			+ + +	50/0.0	SS-9		5	SAND (SM), strong brown (7.5YR 5/6), ven dense, moist, fine to coarse grained sand,	1
-	L.				-	* * * * * * * *			1			5	trace mica, trace rock fragments) WEATHERED ROCK: Gray to brownish	_
Ċ	‡											TR	257.9 orange, severely weathered, very close	-
ġ													fracturing, soft to medium hard, BIOTITE QUARTZ GNEISS	
1	-												HARD ROCK and WEATHERED ROCK: D brown and gray, with orange staining, seve	ark.
-	F				11	*******		1.1.1					<ul> <li>to moderately severely weathered, very close</li> </ul>	
	Ŧ.				1 4	*******			* * *		3		to close fracturing, soft to medium hard, BIOTITE QUARTZ GNEISS	
-	-				1.3									
-					1.0									
-	-				1 4			- 1 -	diana.			注		
-	F				1.0	*******						R	HARD ROCK: Gray with orange staining.	-
1	t.				1.1	******							moderately to slightly weathered, close fracturing, medium hard to moderately hard	
	t				1.4				3.8.4				BIOTITE QUARTZ GNEISS	*
-	-				13									
-	F					******	* * * * * *						-	
2	Ē.						1.111		1			111	-	
1	-				10.00		4		1 -					
119	-												2	
1	F												-	
-	+		-		10000							111	۲.	





SHEET 2 OF 3

														_			SHEET	the second second second second second second second second second second second second second second second s	3	
BECHT	EL PROJ	ECT N	0.: 25	161		MACT	EC PR	OJECT	NO.: 6	468-	09-247				ouisa, VA	1	DLOGIST: E			
SITE D	ESCRIPT	ION: N	lorth A	nna 3 P	rojec	t Supp	lement	2				D	RILLER	R: D.	. Rhodes/K. G	ıy		FLUID	LEVEL	(ft)
ORIN	G NO.: I	VI-20				DRILL	METH	IOD: Mu	d Rota	ary/F	lock Co	re D	RILL	AC	HINE: CME-450	C Tra	ck (RAL)	0 HR.		NA
ROUN	ND ELEV.	: 302	.6 ft	(NAVI	D88)	NORT	HING:	3,909	,794	US	ft (NAC	983) E	ASTIN	G:	11,686,068	US	ft (NAD83)	24 HR.	1	5.5
	DEPTH:	_		AMPLE					-						ROD TYPE: A		HAMMER (			
	STARTED			-		ED: 9/2			DIA.:						t CORE SIZE		L.,			
	DEPTH		W COI					S PER I			or ton	SAMP	VIEW /	L			Dire del		111-0011	
		0.5ft	0.5ft	0.5ft	0	20	40		0	80	100		1/	0		SOIL	AND ROCK D	ESCRIPTIC	N	
(ft)	(ft)	0.51	0.01	0.011		l	l					140.	MOI	G				******		
227.8						Conti	inued f	rom pre	vious p	bage										
	-																K: Gray with o to slightly wea			
-					1.5						:::				fractu	ring, n	nedium hard to	moderatel	y hard,	
1								$i \in \mathbb{R}$		• •	• • •				- BIOT	TE Q	JARTZ GNEIS	SS (continue	ed)	
+	-														- 221.6 HARI	ROC	K: Gray, brow	n and dark	brown	
-	F													$\gg$	- with c	range	staining, mod	erately seve	ere to	
1	FI														- fractu	ring, n	weathered, ve nedium hard, E	ry close to a	JARTZ	
+					• •					• •					GNEI					
-															-					
1	F													))/						
1					1.1										Ę					
+															-					
+																				
1	F I				1.1										+					
-																				
1									• • * •						1					
+														$\gg$						
7	F				1.2										F					
1	F				1.5									$\gg$	- 196.6					
_	E I									• •	• • •				- HARI	Close	K: Gray, slight to wide fractur	tly weathere	ed to	
-	-				1.1										hard,	BIOTI	TE QUARTZ (	GNEISS	,	
1	F										· · ·									
_									• • • •						ŧ.					
1										• •				$\gg$						
-	-				1.1										-					
-	F I				1.1					11	::::				-					
	t																			
+	t I																			
-	+				::				 						+					
1	F				::										F					
	t l																			
-															1					
-	F I				::										-					
	t														ŧ					
-															-					
-	+														}					
-	F				::	· · ·									1					
-	t									• •				K						
-	t l				1.1															
1	F I				::					 					Ŧ					
-	F							* * *			* * *				Ţ					
	±														414					
	F				1.1									V)/						
	+			1								1	1	K	-					



SHEET 3 OF 3

BECH	TEL PRO	JECT	NO.: 25	5161		MACTEC PR	ROJECT NO.	6468	-09-2473	CC	UNT	1: L	ouisa, VA GEO	DLOGIST: E	3. Mabie	
					rojec	t Supplemen				-			Rhodes/K. Guy			EVEL (ft)
	IG NO.:					1	HOD: Mud Ro	otary/F	Rock Core	-	_	_	INE: CME-45C Tra	k (RAL)	0 HR.	NA
-	ND ELEN		2.6.#	(NAV	D88)	NORTHING				-				ft (NAD83)		15.5
	DEPTH					HODS: ASTA				-	_		ROD TYPE: AWJ	HAMMER (		
	STARTE		_			ED: 9/25/09			1			_	CORE SIZE: NQ		D: 2-7/8" T	
ELEV.	DEPTH	1	OW CC	_	LEII		VS PER FOOT			AMP.	V/	L	OUNE OIZE. NO	DITO 03E		-cone
(ft)	(ft)	0.5ft	0.5ft	1	0		0 60	80		NO.	1	0	SOIL	AND ROCK D	ESCRIPTION	4
(11)	(14)	U.U.	Cion	Ultit			l-	1			MOI	6				
					4											
153.0						Continued	from previou	s page	e		-					
	-		-		***					-		111	- 151.6 Boring and	coring termina	ted at 151 0 1	feet
-	t												-			
	ł		8										cement-ben	ed by tremie m tonite grout.	iethod With	
	Ţ		2										24 hour wat	er level measu	ured on 9/25/	2009
	ŧ		1											ng. Borehole		
	t												120.0 feet.			
	t		8										-			
	t															
	F															
-	‡												÷.			
	1												2			
	t		1													
	Ŧ		6													
1	‡		1										2			
	t		k													
-	+		1										<b>T</b> (			
	Ŧ		ŀ.									F	-			
	‡		B -										E.			
1	ţ.												-			
	t												+			
	÷												-			
	Ŧ												2			
	‡				1											
	t l												-			
	÷															
	Į.												2			
	t												1			
	t															
	Ŧ															
	1												20			
	t												5			
	+												-			
-	Į.												1			
	t															
	t															
	Ŧ															
	‡															
													-			
	Ţ												2			
	‡															
	+												-			
	Ŧ												-			
	+															



SHEET 1 OF 2

BECHTEL PROJECT NO.: 2516	1	MACTEC PRO	JECT NO .:	6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST:	B. Mabie	
SITE DESCRIPTION: North Ann	na 3 Projec	t Supplement	2		DRILLER: D. Rhodes/K. C	auy	FLUID L	EVEL (ft)
BORING NO .: M-20		DRILL METHO	DD: Mud Rot	ary/Rock Core	DRILL MACHINE: CME-4	C Track (RAL)	0 HR.	NA
GROUND ELEV .: 302.6 ft	(NAVD88)	NORTHING:	3,909,794	US ft (NAD83)	EASTING: 11,686,068	US ft (NAD83)	24 HR.	15.5
TOTAL DEPTH: 151.0 ft	SAMPLE	METHODS: AS	TM D 1586-0	)8a; 2488-09a; 2	113-08; 6032-08	HAMMER (ID)	: 140-lb. Auto	(MEC-12)
DATE STARTED: 9/21/09	COMPLE	TED: 9/25/09	CASING D	DEPTH: 36.0 ft	CORE BARREL TYPE: W	reline NQ3 Triple	Tube, series 6	& 10 bits

				RL	IN		STR	ΔΤΑ				
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	O G		DESCRIPTION AND REMARKS	
					•						Begin Coring @ 38.9 ft	
263.7	38.9	2.1	N=50/0.0 5:07	(0.5)	(0.0)	RUN 1	(1.2) 21%	(0.0) 0%	2	263.7	WEATHERED ROCK: Gray to brownish orange, severely weathered, very close fracturing, soft to medium hard, BIOTITE QUARTZ GNEISS	38.9
261.6		1.2	2:47	24%	0% (0.0)	RUN 2	21%	0%	R		fracturing, sold to medium hard, BIOTTLE QUARTZ GNEISS	
057.0	44.7	2.5	11:29 3:22/0.2	<u>50%</u> (0.1)	0%	RUN 3			2	257.9		44.7
257.9 256.6		1.3	2:01/0.8 2:54	4%	0%	RUN 4	(9.8)	(5.1)		201.5	HARD ROCK and WEATHERED ROCK: Dark brown and gray, with orange	
		5.0	2:15/0.7 3:35/0.3	(0.8)	(0.0)	RUN 5	72%	38%	团	_	staining, severely to moderately severely weathered, very close to close fracturing, soft to medium hard, BIOTITE QUARTZ GNEISS	
			4:29	(5.0) 100%	(2.8) 56%						(Many joints/fractures at 0-90°, open)	
251.6	51.0	3.0	2:43 2:02 3:21	(0.7)	(0.0)	RUN 6					(Several fractures/joints)	
248.6	54.0	010	3:44	23%	0%					-		
246.6	56.0	2.0	2:15	(1.0) 50%	(0.5) 25%	RUN 7					(2 joints at 70-80°, open)	
		2.3	1:25 2:05	(2.3)	(1.8)	RUN 8					(4 joints at 0-10°, open; 2 joints at 40-50°, open)	
244.3	58.3	2.7	1:52 1:29 1:52/0.3	100%	78%	RUN 9	(21.0)			244.3	HARD ROCK: Gray with orange staining, moderately to slightly weathered,	58.3
241.6	61.0		1:52/0.3	93%	74%	<b>D1</b>	93%	68%			close fracturing, medium hard to moderately hard, BIOTITE QUARTZ GNEISS (1 joint at 0-10°, open with orange staining; 4 at 70-80°, open with orange	
		5.0	1:04/0.7 2:42 3:01	(4.8) 96%	(2.5) 50%	RUN 10				_	staining)	
			2:04 2:10								(10 joints at 0-40°, open to tight; 5 joints at 70-80°, open)	
236.6	66.0	5.0	2:00 2:14 2:11	(4.1)	(2.9)	RUN 11					(6 joints at 20-40°, open)	
			1:41 1:40	82%	58%					-		
231.6	71.0		1:44 1:34									
201.0	/1.0	3.8	1:32	(3.5)	(2.9) 76%	RUN 12					(4 joints at 40-50°, open)	
227.8	74.8		1:35 1:31	92%	10%							
226.6			3:02/0.8	(1.2)	(1.0)	RUN 13					(2 joints at 60-70°, tight)	
		5.0	2:46 1:44 1:38	(4.9)	83%	RUN 14				_	(5 joints at 0-10°, tight to open; 3 joints at 30°, open)	
			1:26	98%	84%							
221.6	81.0	5.0	1:12	(3.1)	(1.0)	RUN 15	(18.2)	(9.3)		221.6	HARD ROCK: Gray, brown, and dark brown, with orange staining, moderately	81.0
			1:45 2:43	62%	20%		73%	37%			severe to moderately weathered, very close to close fracturing, medium hard, BIOTITE QUARTZ GNEISS	
216.6	86.0		3:08 1:45								(several joints at 0-20°, open)	
		5.0	1:43 1:28	(3.4) 68%	(2.0) 40%	RUN 16	]			_	(8 joints at 0-30°, open)	
216.6 211.6			1:36 2:14	0070	4070							
211.6	91.0	5.0	2:24	(3.3)	(1.7)	RUN 17					(5 joints at 0-10°, open; 8 at 30-40°, open)	
		5.0	2:02 2:27	66%	34%	KON I/				-	(5 joints at 0-10, open, 6 at 30-40, open)	
000.0	00.0		2:52									
206.6 201.6 196.6 193.6 191.6	96.0	5.0	2:05	(3.9)	(2.2)	RUN 18	1				(12 joints at 0-20°; 2 joints at 50-60°, open)	
			1:21 1:28	78%	44%							
201.6	101.0		2:46 3:58									
		5.0	2:38 1:37	(4.5) 90%	(2.4) 48%	RUN 19				-	(14 joints at 0-20°, open; 3 at 20-30°, open)	
			1:50 2:01									
196.6	106.0	3.0	2:12 3:01	(3.0)	(2.0)	RUN 20	(44.4)	(43.3)		196.6	HARD ROCK: Gray, slightly weathered to fresh, close to wide fracturing, hard to	106.0
193.6	109.0		4:09 4:12	100%	67%		99%	96%		-	very hard, BIOTITE QUARTZ GNEISS	
101.0		2.0	4:25 6:51	(2.0)	(2.0)	RUN 21	1				(3 joints at 0-20°, open; 1 joint at 70°, open) (1 joint at 10-20°, tight)	
191.6	111.0	5.0	3:51	(5.0)	(5.0)	RUN 22	1				(2 joints at 20-30°, tight)	
:L			3:09	100%	100%				011			

Volume 1, Revision 0



SHEET 2 OF 2

BECHTEL PROJECT NO.: 25161		MACTEC PROJ	JECT NO .: 6	6468-09-2473	COUNTY:	Louisa, VA	GEOLOGIST:	B. Mabie	
SITE DESCRIPTION: North Anna	a 3 Projec	t Supplement 2			DRILLER:	D. Rhodes/K. Gu	у	FLUID L	EVEL (ft)
BORING NO .: M-20		DRILL METHON	D: Mud Rota	ary/Rock Core	DRILL MAG	CHINE: CME-450	Track (RAL)	0 HR.	NA
GROUND ELEV .: 302.6 ft (I	NAVD88)	NORTHING: 3	3,909,794	US ft (NAD83)	EASTING:	11,686,068	US ft (NAD83)	24 HR.	15.5
TOTAL DEPTH: 151.0 ft	SAMPLE	METHODS: AST	M D 1586-0	8a; 2488-09a; 2	113-08; 603	2-08	HAMMER (ID)	: 140-lb. Auto (	(MEC-12)
DATE STARTED: 9/21/09	COMPLET	TED: 9/25/09	CASING D	EPTH: 36.0 ft	CORE BAR	RREL TYPE: Wire	eline NQ3 Triple	Tube, series 6	& 10 bits

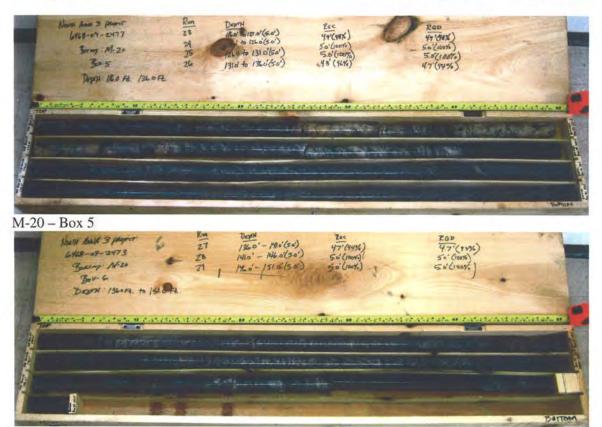
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	JN RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RQD (ft) %	L O G	DESCRIPTION AND REMARKS
					•					Continued from previous page
186.6	116.0	5.0	4:16 3:28 3:30 4:37 4:01 4:28	(4.9) 98%	(4.9) 98%	RUN 23				HARD ROCK: Gray, slightly weathered to fresh, close to wide fracturing, hard to very hard, BIOTITE QUARTZ GNEISS ( <i>continued</i> ) (3 joints at 10-20°, tight)
181.6	121.0	5.0	4:36 5:10 4:55 4:42 4:26	(5.0) 100%	(5.0) 100%	RUN 24				(4 joints at 0-20°, tight)
176.6	126.0	5.0	4:48 4:10 2:53 3:01 3:11	(5.0) 100%	(5.0) 100%	RUN 25				(1 joint at 20°, tight; 1 joint at 60-70°, tight)
171.6	131.0	5.0	3:48 3:19 3:38 3:37 3:48	(4.8) 96%	(4.7) 94%	RUN 26				
166.6	136.0	5.0	4:10 4:30 4:49 4:38	(4.7) 94%	(4.7) 94%	RUN 27				(1 joint at 70°, tight)
161.6	141.0	5.0	4:50 4:55 5:31 5:26 6:00	(5.0) 100%	(5.0) 100%	RUN 28				(1 joint at 30°, tight)
156.6	146.0	5.0	7:14 8:01 4:00 4:07 4:55	(5.0)	(5.0) 100%	RUN 29				(2 joints at 60-70°, tight)
151.6	151.0		4:00 3:29 3:48						15	1.6 1 Boring and coring terminated at 151.0 feet.
										Boring closed by tremie method with cement-bentonite grout.
									-	24 hour water level measured on 9/25/2009 prior to drilling. Borehole was at a depth of 126.0 feet.
									-	
									-	
									-	
									-	
									-	

# North Anna 3 Project MACTEC Project No. 6468-09-2473



M-20 – Box 4

# North Anna 3 Project MACTEC Project No. 6468-09-2473

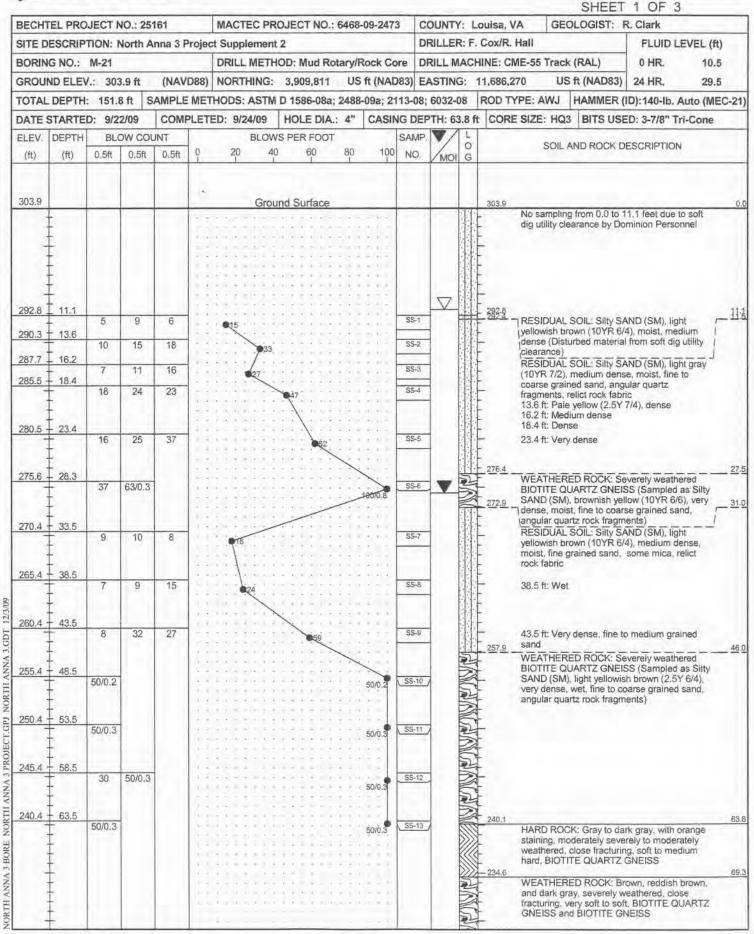


M-20 - Box 6



Prepared By JJJ Date /2/16/09

Checked By MM Date 12/16/09



DU/E/C





SHEET 2 OF 3

DEOU		IFOT	10 . 05	164		MACTEC		IECT NO	GACO	00 247	2 1		/. 1		CE	DLOGIST: F	2 OF 3		
	TEL PRO							JECT NO .:	0468	09-247				Louisa, VA	GEC	JLUGISI: F		1121 12	~
			North A	nna 3 F	rojec	t Suppleme	-							. Cox/R. Hall	-		FLUID LEV		
	IG NO.:							D: Mud Rot						HINE: CME-55			0 HR.	10.	
GROU	ND ELEV	.: 303	3.9 ft	(NAV	D88)	NORTHING	3:	3,909,811	US	ft (NAD	083) E	ASTIN	G:	11,686,270		ft (NAD83)	24 HR.	29.	
TOTAL	DEPTH	151.	8 ft S	SAMPLE	MET	HODS: AST	IM E	0 1586-08a;	2488	-09a; 21	13-08	; 6032-0	08	ROD TYPE: A	<b>WJ</b>	HAMMER (	ID):140-Ib. Au	to (Mi	EC
DATE	STARTE	D: 9/2	2/09	COMP	PLETE	ED: 9/24/09		HOLE DIA .:	4"	CASIN	IG DE	PTH: 63	3.8 f	t CORE SIZE	: HQ3	BITS USE	D: 3-7/8" Tri-	Cone	
ELEV.	DEPTH	BL	OW CO	UNT		BLC	ows	PER FOOT			SAMF	P. V/	L		201		ECODIDITION		
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	NO.	MOI	O G		SOIL	AND ROCK D	ESCRIPTION		
229.1				ļ	<u> </u>	Continue	d fro	m previous	page				-						-
	+												2	] 227.1					_
	Ŧ															K: Black to lig derately weat	ht gray, with bro hered, close	own	
-	‡												14	224.1 fractu	uring, n	nedium hard, E	BIOTITE GNEIS	ss	
	t												1	VVEA	THER	ED ROCK: Lig	ght gray, severe g, soft, BIOTITE	ly	Γ
	+													QUA	RTZ G	NEISS	-		Γ
	‡				1									HAR	D ROC	K: Light gray,	moderately g, moderately h	ard to	
	±													hard,	BIOTI	TE QUARTZ (	GNEISS		
	+												V]]	HAR	D ROC	K: Dark and li	ght gray to blac htly weathered,	k, close	
	Ŧ I													fractu	uring, s	oft to hard, BI	IOTITE GNEISS	S with	
	‡				::		: :							212.1	blende	NK. 0	d		
	+													weat	hered t	o fresh, mode	rk gray, slightly rately close to w	vide	
- 7	Ŧ				1									_ fractu	uring, h	ard to very ha BIOTITE GNI	rd, BIOTITE GN	IEISS	
	‡				1.1								$\otimes$		JANIZ	BOTTEGN	E100		
	t													Ł					
	Ŧ												$\gg$	F					
	‡						: :							\$					
	t						-						$\gg$	Ł					
	+												***	4					
	‡ I				1.1								$\gg$	Į.					
	<u>+</u>				1:1								K(((	<u>+</u>					
	+												$\mathbb{W}$	}					
	‡				1.									£					
	±				1 : :								V//	上					
	+													+					
	‡												V//	1					
_	‡				* *					1 4 3 1 1 1				ţ.					
	±													ł					
	Ŧ													+					
_	‡					 								ŧ.					
	t													ł					
	+				1.1					112				1					
-	‡													F					
2	‡				1.1									\$					
D	t					, · · · · ·							$\gg$	ł					
-	Ŧ				1.1									<u>-</u>					
5	‡				1.1									Į.					
	t												<b>**</b>	£					
	Ŧ				1.1									F					
	‡													t i					
	+				• •								V)/	1					
-	Ŧ				1.1									<u>_</u>					
	t												1//	1					
	+													1					
	T				111								11	1					





SHEET 3 OF 3

	TEL PRO	JEGII	v0	23101			WACTEC P	RUJECTN	0.: 64	68-09-2	473	COU	NIY	: L(	ouisa, VA GE	OLOGIST: F	Clark		
SITE D	ESCRIP	TION:	North	Ann	a 3 Pr	oject	Supplemen	nt 2				DRIL	LER	: F.	Cox/R. Hall		FLUID L	EVEL (	ft)
ORIN	IG NO.:	M-21		~			DRILL MET	HOD: Mud	Rotar	y/Rock	Core	DRIL	LM	ACH	INE: CME-55 Trac	k (RAL)	0 HR.	10	.5
ROU	ND ELEV	.: 30	3.9 ft	(	NAVE	(88	NORTHING	: 3,909,8	11	US ft (N	AD83)	EAS	TING	9: 1	1,686,270 US	S ft (NAD83)	24 HR.	29	9.5
OTAL	DEPTH	: 151.	8 ft	SAN	IPLE	METH	ODS: AST	VI D 1586-0	8a; 24	188-09a;	2113-	08; 60	32-0	8	ROD TYPE: AWJ	HAMMER (	D):140-lb.	Auto (N	IEC-
ATE	STARTE	D: 9/2	2/09	C	OMP	LETE	D: 9/24/09	HOLE D	IA.: 4	1" CA	SING D	DEPTH	1: 63	.8 ft	CORE SIZE: HQ	3 BITS USE	D: 3-7/8" T	ri-Cone	9
ELEV.	DEPTH	BL	ow c	OUNT	Г	1		WS PER FO			SA	MP.	1	LO	SOIL	AND ROCK D	ESCRIPTION	J	
(ft)	(ft)	0.5ft	0.5	ft 0	).5ft	0	20 4	40 60	8	30 1	100 N	D. /1	ION		COL				_
154.3						•	Continued	from previo	ous pa	age	-								
	-					1.1				111	2			M	152.1				1
3	-								_		-		ľ			coring termina	ted at 151.8	feet.	-1.
																ed by tremie m ntonite grout.	tethod with		



		IFOT				ACTEC		07.11	0.0	400 00 0470	COUNTY: Laudes VA		1 OF 2	
			NO.: 2516					CTN	0.: 6	468-09-2473	COUNTY: Louisa, VA	GEOLOGIST: F		
SITE D	ESCRIP	TION:	North An	na 3 Pr	-						DRILLER: F. Cox/R. Hal		FLUID LEV	/EL (ft)
BORIN	G NO.:	M-21			D	RILL ME	THOD:	Mud	Rota	ry/Rock Core	DRILL MACHINE: CME-	55 Track (RAL)	0 HR.	10.5
GROUN	ND ELEV	1.: 3	303.9 ft	(NAVE	088) N	IORTHIN	G: 3,	909,81	11	US ft (NAD83)	EASTING: 11,686,270	US ft (NAD83)	24 HR.	29.5
OTAL	DEPTH	151	.8 ft	SAM	PLE MI	ETHODS	ASTN	1 D 15	86-08	8a; 2488-09a; 2	113-08; 6032-08	HAMMER (ID):	140-lb. Auto (M	EC-21)
DATES	STARTE	D: 9/	22/09	COM	PLETE	D: 9/24/	09 0	CASIN	IG D	EPTH: 63.8 ft	CORE BARREL TYPE: N	Wireline HQ3 Triple	Tube, series 6 &	10 bits
									arter a vale. Han					
ELEV.	DEPTH	RUN	DRILL		JN	SAMP.	STR		L					
(ft)	(ft)	(ft)	RATE (Min/ft)	REC. (ft) %	RQD (ft)	NO.	REC. (ft) %	RQD (ft) %	O G		DESCRIPTIO	ON AND REMARKS		
			(((((((((((((((((((((((((((((((((((((((	/0			70	70						
		2.0	5:34	(2.0)	(4.4)	RUN 1	(4.5)	(2.2)		240.1 HARD	Begin C ROCK: Gray to dark gray, w	oring @ 63.8 ft	larataly acyaraly tr	, 6
240.1	63.8	3.0	3:21	(2.0) 67%	(1.1) 37%	KUN I	(4.5) 82%	(3.2) 58%		moder	ately weathered, close fractu			) -
237.1	66.8	4.0	2:49	(2.5)	(2.1)	RUN 2				-	TZ GNEISS s at 45°, tight; foliation at 45°	°)		
			3:37 3:55	63%	53%		10.11	10		-234.6 (2 joint	s at 65°, tight; foliation at 65°	o´		6
233.1	70.8	10	2:42	(0.0)	(0.0)	RUN 3	(2.4) 32%	(0.0) 0%	R		HERED ROCK: Brown, redd red, close fracturing, very so			
232.1	71.8	1.0	2:28	(0.0)	0%	RUN 3			R		E GNEISS			
230.1	73.8	5.0	2:41 2:27	(0.5)	(0.0) 0%	RUN 5					s at 0-10°, tight with trace iro	on staining; 5 joints at 45	5°, tight with trace	
227.1	76.8		2:33 2:11	(1.9)	(0.0)				K	iron sta	aining; foliation at 45°)		-	
	78.8	4.0	2:33 2:28	38%	0%	RUN 6	(1.7)	(0.7) 23%		HARD	ROCK: Black to light gray, w acturing, medium hard, BIO	vith brown staining, mod	lerately weathered	
225.1			3:05	63%	18%		57%			224.1 (3 joint	s at 30°, tight; 1 joint at 80°,	tight with quartz vein; fo		
223.1	80.8 81.8	1.0	3:14 3:59	(1.0)	(0.0)	RUN 7	(0.8)	(0.0)	R		HERED ROCK: Light gray, s	severely weathered, close	se fracturing, soft,	
		2.6	5:15 2:27	100%	0%	RUN 8	(1.7)	(0.7)	æ		E QUARTZ GNEISS ROCK: Light gray, moderate	elv weathered, close frac	cturing, moderately	
219.5	84.4	2.4	2:45/0.6	(2.5)	(1.3)	RUN 9	(9.1)	41%	$\otimes$	hard to	hard, BIOTITE QUARTZ GI	NEISS		
217.1	86.8		5:14 6:58	(2.3)	(1.5)		98%	53%			s at 0-10°, tight; 2 joints at 4 ROCK: Dark and light gray t			
		5.0	3:25	96%	(2.8)	RUN 10				- weathe	red, close fracturing, soft to	hard, BIOTITE GNEISS		
			3:33 4:34 2:54	100%	56%						s at 60°, tight: foliation at 60° s at 0-10°, tight)	-)		
212.1	91.8	5.0	5:18 5:53	(5.0)	(3.1)	RUN 11	(59.9)	(57.2)			s at 50°, tight; foliation at 50° ROCK: Gray to dark gray, sl	the same way when the same when the same when the same way the same way the same way the same way the same way	h modoratoly alos	
		5.0	3:23	100%	62%	KON II	100%		)	to wide	fracturing, hard to very hard			
			3:42 3:37							_ GNEIS	S s at 30-45°, tight with iron sta	ainina)		
207.1	96.8	5.0	3:11 5:46	(5.0)	(4.5)	RUN 12			$\gg$	( )	s at 50-60°, tight with trace o	0,	t 60° with trace	
			5:48 5:00	100%	90%						chlorite, magnetite, and pyr			
202.4	101.0		3:02 4:50							-				
202.1	101.8	5.0	2:25	(5.0)	(5.0)	RUN 13				(3 joint	s at 45°, tight with trace horr	blende and iron staining	g; foliation at 45°)	
			2:33 2:46	100%	100%					_				
197.1	106.8		2:48 3:09							-				
		5.0	2:43 2:08	(5.0) 100%	(5.0) 100%	RUN 14				(2 join	s at 40°, tight; 1 joint at 60°,	tight)		
			2:11	100%	100%					-				
192.1	111.8		3:42 1:57							-				
		5.0	2:38 2:17	(5.0) 100%	(5.0) 100%	RUN 15				(1 join	at 30°, tight)			
			2:02 2:08							-				
187.1	116.8	5.0	2:12	(5.0)	(4.0)	DUN 40			$\langle \rangle \rangle$	(0)	a at 20° tight 4 months	at 70° with trace and the		
		5.0	3:49 2:42	(5.0) 100%	(4.8) 96%	RUN 16				(3 join	s at 30°, tight; 1 quartz vein :	at 70° with trace pyrite)		
			2:12 2:30							_				
182.1	121.8	5.0	2:42	(5.0)	(5.0)	RUN 17				(2 ioin	s at 25°, tight; 1 joint at 45°,	tight: trace pyrite)		
		0.0	2:33	100%						- (2)011	our construction of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second	san, nuce pyrite/		
			2:42							-				
177.1	126.8	5.0	2:48 2:40	(4.9)	(4.9)	RUN 18				(3 join	s at 50°, tight; foliation at 50°	°)		
			2:38 2:48	98%	98%					-		-		
170.4	101.0		2:55											
172.1	131.8	5.0	2:10	(5.0)	(5.0)	RUN 19				(1 join	at 45°, tight)			
			2:09 2:02	100%	100%					<u>_</u>				
167.1	136.8		1:53 1:48						V//	E .				
191.1	100.0	5.0	2:51	(5.0)	(5.0)	RUN 20	1			(Nojo	nts)			

Volume 1, Revision 0

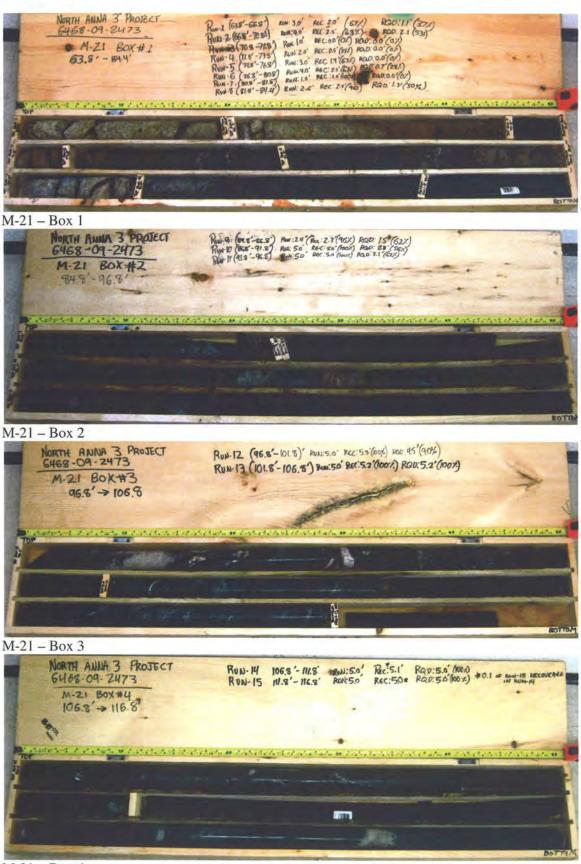


SHEET 2 OF 2

BECHTEL PROJECT NO.: 25161		MACTEC PRO	JECT NO .: 0	6468-09-2473	COUNTY:	Louisa, VA	GEOLOGIST: I	R. Clark	
SITE DESCRIPTION: North Anna	3 Project	t Supplement 2			DRILLER: F	F. Cox/R. Hall		FLUID L	EVEL (ft)
BORING NO .: M-21		DRILL METHO	D: Mud Rot	ary/Rock Core	DRILL MAC	HINE: CME-55	Track (RAL)	0 HR.	10.5
GROUND ELEV.: 303.9 ft (N	NAVD88)	NORTHING:	3,909,811	US ft (NAD83)	EASTING:	11,686,270	US ft (NAD83)	24 HR.	29.5
TOTAL DEPTH: 151.8 ft S	SAMPLE N	METHODS: AST	rm D 1586-0	)8a; 2488-09a; 2	113-08; 6032	2-08	HAMMER (ID):	: 140-lb. Auto (	(MEC-21)
DATE STARTED: 9/22/09 C	COMPLET	ED: 9/24/09	CASING D	DEPTH: 63.8 ft	CORE BAR	REL TYPE: Wire	eline HQ3 Triple	Tube, series 6	& 10 bits

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RQD (ft) %	L O G	DESCRIPTION AND REMARKS
					•					Continued from previous page
162.1	141.8	5.0	2:31 1:54 1:48 2:03 2:26 2:06 2:46		100% (5.0) 100%	RUN 21	-			HARD ROCK: Gray to dark gray, slightly weathered to fresh, moderately close to wide fracturing, hard to very hard, BIOTITE GNEISS to QUARTZ BIOTITE GNEISS (continued) (1 joint at 55°, tight; foliation at 55°; trace pyrite)
157.1	146.8	5.0	2:05 2:08 2:33 2:25 2:11	(5.0) 100%	(5.0) 100%	RUN 22	-			(No joints; trace pyrite and hornblende)
152.1	151.8		2:04							152.1 1 Boring and coring terminated at 151.8 feet.
										Boring closed by tremie method with cement-bentonite grout.

North Anna 3 Project MACTEC Project No. 6468-09-2473



M-21 – Box 4

North Anna 3 Project MACTEC Project No. 6468-09-2473



## M-21 – Box 5



M-21 - Box 6

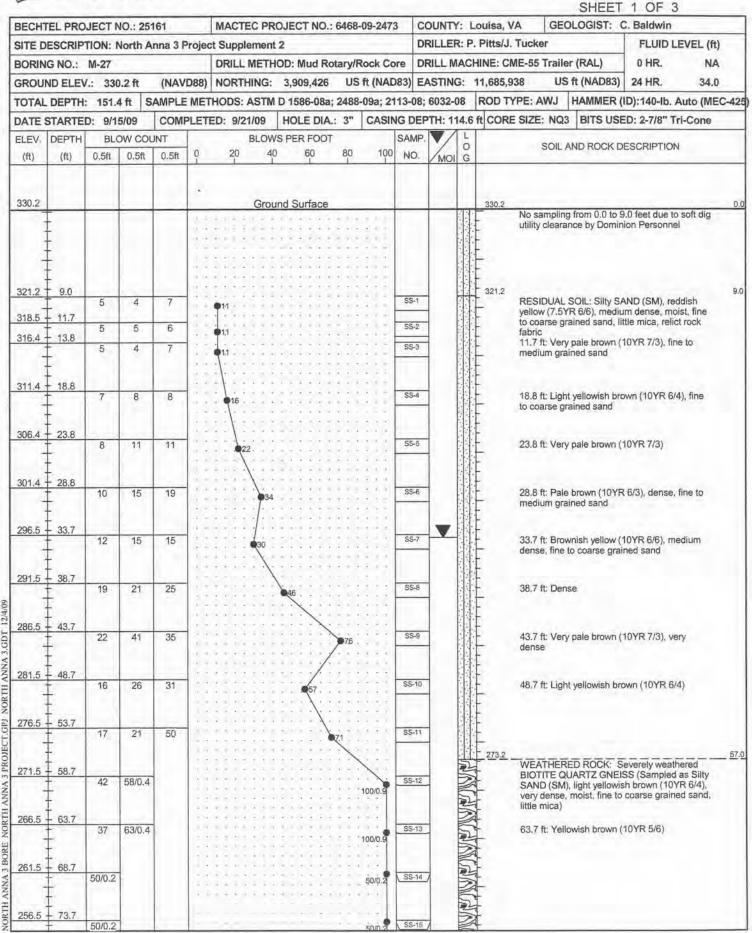


M-21 - Box 7



Prepared By JJJ Date 12/16/09

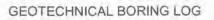
Checked By MAL Date 12/10/09



#### GEOTECHNICAL BORING LOG



				104			0.1505.110	0.400	00.045					050	NAME AND ADDRESS OF TAXABLE PARTY.	2 OF	
	EL PRO					MACTEC PR		6468-	09-247				ouisa, VA		LOGIST: 0		
			North A	nna 3 F	Proje	ct Supplement							. Pitts/J. Tucke				LEVEL (ft)
BORIN	G NO.:	M-27				DRILL METH							HINE: CME-55			0 HR.	NA
GROUN	ID ELEV	/.: 330	).2 ft	(NAV	'D88)	NORTHING:	3,909,426	US	ft (NAE	983) E	ASTIN	G:	11,685,938	US	ft (NAD83)	24 HR.	34.0
TOTAL	DEPTH	: 151.4	1ft S	AMPLE	ME	THODS: ASTM	D 1586-08a;	2488	-09a; 21	13-08	; 6032-0	80	ROD TYPE: A	WJ	HAMMER (	D):140-lb.	Auto (MEC
DATE S	TARTE	D: 9/1	5/09	COM	PLET	ED: 9/21/09	HOLE DIA.	: 3"	CASI	IG DE	PTH: 1'	14.6	ft CORE SIZE:	NQ3	BITS USE	D: 2-7/8"	Tri-Cone
ELEV.	DEPTH	BLC	ow cou	JNT		BLOW	S PER FOOT			SAMP	. V/	L			ND ROCK D		N
(ft)	(ft)	0.5ft	0.5ft	0.5ft	P	20 40	60	80	100	NO.	мо					ESCRIPTIO	111
					•	0											
255.4					+	Continued f	rom previous	page	· · · · · · · · · · · · · · · · · · ·		+	5	WEAT	HERE	D ROCK: Se	everely weat	thered
1	-				1.1				::			5	BIOTI	TE QU	ARTZ GNEIS	SS (Sampled	d as Silty
251.5	- 78.7	50/0.1			1::				· · ·	SS-16		5	very d	ense, r	noist, fine to	coarse grain	ned sand,
-	-	50/0.1			1::	*******			50/0.1		1		iittle m	nica) (continued)			
- 1									::			5	_				
1	-				: :							D	F				
243.8	86.4				1::							5	F			5 7/6	
1	-	50/0.2			1::				50/0.2	SS-17	1	D	– 86.4 ft	: Pale	Yellow (2.5YI	K 7/3)	
220 4	- 90.8				1::				· · ·			5	-				
239.4-	- 90.6	50/0.3			1 : :				50/0.3	SS-18	7		E				
1	-											5	Ē				
234.4	- - 95.8				111							D					
1	-	50/0.2			1.1				50/0.2	SS-19	7	5	95.8 ft	: Very	pale brown (*	10YR 7/4)	
-	-				1.1							D					
229.4	- 100.8								::	00.51	_	5	_				
-	_	41	59/0.5						100/1.0	SS-20	-	D	-				
1	-				1::							5					
224.4	- 105.8	50/0.1			1::					SS-21			-				
+	-	50/0.1			1::				50/0.1	- se al	1	5					
1	-								::			D					
219.4-	- 110.8	50/0.1					* • • • • •		50/0.1	SS-22	7	5	-				
1	-				1::							D	1150	ft: Har	d Drilling/Bit (	Chatter: SP1	Refuse
214 4	- 115.8				1::				11			R	215.2 with n	o pene	tration at 115	.8 ft	/
214.4		100/0.0			1.1		* * * * * * *	:::	100/0.0	SS-23	1	$\otimes$	L HARD	ROCH	C: Gray and v staining, mod	vhite to light erately seve	gray, relv to
-													- moder	rately v	eathered, ve	ry close to c	lose
-	-							• • •				$\gg$	BIOTI	TE QU	ARTZ GNEIS	SS	y nard,
1	-				1::							$\ $	HARD	ROCI	C: Gray and v	white with tra	ice
1					1.							$\mathbb{W}$	orang weath	e staini ered, v	ng, moderate ery close to r	ely to slightly noderately o	lose
-					11:		* * * * * * *						- fractu		oderately har		
-	-				::								L QUAP	UZ GN	2100		
1	-				1.1								F				
-	-				1::								<u> </u>				
	_				1.1				:::								
-	-				1::				:::				-				
-	F												193.8	POOL	( Crow and	ubito with too	100
	-				1.			· · ·					- orang	e staini	K: Gray and w ng, moderate	ely to very sl	ightly
_								:::					weath fractu	ered, o	lose to mode	d to hard. B	IOTITE
-													QUAF	fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS			
-	-											$\otimes$	ł				
1	-				1.							$\gg$	1				
-												$\leq$					
1	L			1						1	1	1222	1				





BECHT	EL PRO	JECT N	NO.: 2	25161		MACTE	C PR	DJECT NO .:	6468	09-2473	3 (	COUNT	r: L	ouisa, VA	GEC	DLOGIST: 0	C. Baldwin	
SITE D	ESCRIP	TION: N	North	Anna 3	Proje	ct Supple	ment	2			1	RILLER	R: P	. Pitts/J. Tucke	er		FLUID L	EVEL (ft)
BORIN	G NO .:	M-27	_			DRILL	/ETH	DD: Mud Ro	tary/F	Rock Co	re I	RILL M	AC	HINE: CME-55	Traile	r (RAL)	0 HR.	NA
	ND ELEN		).2 ft	(NA)	VD88)	NORTH	ING:	3,909,426	US	ft (NAD	(83)	ASTIN	G:	11,685,938	US	ft (NAD83)	24 HR.	34.0
	DEPTH		-	SAMPL	EMET	THODS: A	STM	D 1586-08a	2488	-09a; 21	13-08	3; 6032-	80	ROD TYPE: A	WJ	HAMMER (	D):140-lb.	Auto (MEC-4
	TARTE			10000		ED: 9/21		HOLE DIA		-			-	ft CORE SIZE:	NQ3			
	DEPTH	1		OUNT	T			S PER FOOT		1	SAM	-	L					
(ft)	(ft)	0.5ft	0.5f		0	20	40	60	80	100	NO.	MOI	G		SOIL	AND ROCK D	ESCRIPTION	1
					1		-		-									
				1.2														
180.6			-	-		Contin	ued fr	om previou	spage		-	-	000	-				
-	-		-	-			4.4.3					-	277	178.8 Boring	g and g	coring termina	ted at 151.4	15 feet.
-	-													+		ed by tremie m		
-	-													- ceme	nt-ben	tonite grout.	iou iou mui	
-																er level measi		
1	-													- prior t 146.4	to drilling feet.	ng. Borehole	was at a dep	th of
1,	-													-				
1	-													Ē				
-	-													1				
-	-													2				
-	-													-				
-	-													E-				
1	-													F				
1	-											1		È				
-														-				
												1		E				
-	-													-				
-	-													F				
1														Ē.				
1	2													E				
1	5													2				
1	2													1				
1.1	-													-				
-	F													-				
1	-		1											F				
7	-													F				
	Ē.		1											E				
-	2		Ľ –											E				
i i	-													1				
														F				
i e	F													F				
1	1													F				
1	-													E.				
1														F				
	t													5				
	-													-				
į.														F				
	1		1											F				
														-				
1														-				
1	1													F				

#### GEOTECHNICAL CORING LOG



SHEET 1 OF 1

BECHTEL PROJECT NO.: 25161		MACTEC PRO	JECT NO .: 0	6468-09-2473	COUNTY:	Louisa, VA	GEOLOGIST: 0	C. Baldwin	
SITE DESCRIPTION: North Anna	a 3 Projec	t Supplement 2			DRILLER:	P. Pitts/J. Tucke	r	FLUID L	EVEL (ft)
BORING NO.: M-27		DRILL METHO	D: Mud Rot	ary/Rock Core	DRILL MA	CHINE: CME-55	Frailer (RAL)	0 HR.	NA
GROUND ELEV.: 330.2 ft (I	NAVD88)	NORTHING:	3,909,426	US ft (NAD83)	EASTING:	11,685,938	US ft (NAD83)	24 HR.	34.0
TOTAL DEPTH: 151.4 ft S	SAMPLE	METHODS: AST	TM D 1586-0	)8a; 2488-09a; 2	113-08; 603	2-08	HAMMER (ID):	140-lb. Auto (	MEC-425)
DATE STARTED: 9/15/09 COMPLETED: 9/21/09 CASING DEPTH: 114.6 ft CORE BARREL TYPE: Wireline NQ3 Triple Tube, series									bit

251.4         7.6.3         2.8         3.37         (0.1)         (0.0)         (0.1)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0	ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE	REC.	JN RQD (ft) %	SAMP. NO.	STR REC. (ft) %	ATA RQD (ft) %	L O	DESCRIPTION AND REMARKS
51:4         7:8         2.8         53:7         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)	(11)	(11)	(11)	(Min/ft)	%			%	%	G	,
Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick         Chick <th< td=""><td></td><td></td><td>0.0</td><td>0.57</td><td></td><td>(0.0)</td><td>DUNIA</td><td></td><td>(0.0)</td><td></td><td></td></th<>			0.0	0.57		(0.0)	DUNIA		(0.0)		
4.8         6.6         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.0)         (0.	251.4		2.8	3:08			RUN 1				
243.8         96.4         -2.40.8         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5         0.5	248.6	81.6	4.8		(0.0)	(0.0)	RUN 2			R	
243.8         96.4         -2.400.1         -         55-17         86.4 ft: Pale Yellow (2.5VR 7/3)           243.8         96.4         -         -         55-17         95.8 ft: Very pale brown (10YR 7/4)           95.8         ft: Pale Yellow (2.5VR 7/3)         -         55-17         95.8 ft: Very pale brown (10YR 7/4)           95.8         ft: Pale Yellow (2.5VR 7/3)         -         55-17         95.8 ft: Very pale brown (10YR 7/4)           95.8         115.0         0.6         -         -         55-27           N=600.7         -         55-27         -         -           115.5         0.6         -         -         -           214.4         115.5         0.6         -         -         -           115.0         115.0         116.0 ft: Hard Drilling/Bit Chatter, SPT Refusal with no penetration at 115.8 ft         -           214.4         115.5         0.6         -         -         -           115.0         116.0 ft: Hard Drilling/Bit Chatter, SPT Refusal with no penetration at 115.8 ft         -           214.4         115.5         0.6         -         -         -           115.0         116.0 ft: Hard Drilling/Bit Chatter, SPT Refusal with no penetration at 115.8 ft         -				4:10						2	
214.4         115.8         0.6         Preduct         SS-17         86.4 ft: Pale Yellow (2.5YR 7/3)           214.4         115.8         0.6         Preduct         SS-18         95.8 ft: Very pale brown (10YR 7/4)           214.4         115.8         0.6         Preduct         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)	242.0	96.4		2:30							•
1         0         N=600.2         SS-16         95.8 ft: Very pale brown (10YR 7/4)           95.8 ft: Very pale brown (10YR 7/4)         N=600.7         SS-20         115.0 ft: Hard Drilling/Bit Chatter; SPT Refusal with no panetration at 115.8 ft           214.4         115.8         0.6         M=600.6         SS-21           214.4         115.8         0.6         M=600.6         SS-21           214.4         115.8         0.6         M=600.6         (0.6)         (0.6)           214.4         115.8         0.6         M=600.6         (0.6)         (0.6)         (0.6)           215.2         14.0         5.0         115.0 ft: Hard Drilling/Bit Chatter; SPT Refusal with no panetration at 115.8 ft           208.8         121.4         5.0         115.0 ft: Mard Drilling/Bit Chatter; SPT Refusal with no panetration at 115.8 ft           208.8         121.4         5.0         115.0 ft: Mard Drilling/Bit Chatter; SPT Refusal with no panetration at 115.8 ft           208.8         121.4         5.0         115.0 ft: Mard Drilling/Bit Chatter; SPT Refusal with no panetration at 115.8 ft           208.8         121.4         5.0         2.00         10.05         6.00         10.14           208.8         121.4         10.05         6.00         8.00         10.27	243.0	00.4					SS-17	1		24	86.4 ft: Pale Yellow (2.5YR 7/3)
1         0         N=600.2         SS-16         95.8 ft: Very pale brown (10YR 7/4)           95.8 ft: Very pale brown (10YR 7/4)         N=600.7         SS-20         115.0 ft: Hard Drilling/Bit Chatter; SPT Refusal with no panetration at 115.8 ft           214.4         115.8         0.6         M=600.6         SS-21           214.4         115.8         0.6         M=600.6         SS-21           214.4         115.8         0.6         M=600.6         (0.6)         (0.6)           214.4         115.8         0.6         M=600.6         (0.6)         (0.6)         (0.6)           215.2         14.0         5.0         115.0 ft: Hard Drilling/Bit Chatter; SPT Refusal with no panetration at 115.8 ft           208.8         121.4         5.0         115.0 ft: Mard Drilling/Bit Chatter; SPT Refusal with no panetration at 115.8 ft           208.8         121.4         5.0         115.0 ft: Mard Drilling/Bit Chatter; SPT Refusal with no panetration at 115.8 ft           208.8         121.4         5.0         115.0 ft: Mard Drilling/Bit Chatter; SPT Refusal with no panetration at 115.8 ft           208.8         121.4         5.0         2.00         10.05         6.00         10.14           208.8         121.4         10.05         6.00         8.00         10.27											
1         0         N=600.2         SS-16         95.8 ft: Very pale brown (10YR 7/4)           95.8 ft: Very pale brown (10YR 7/4)         N=600.7         SS-20         115.0 ft: Hard Drilling/Bit Chatter; SPT Refusal with no panetration at 115.8 ft           214.4         115.8         0.6         M=600.6         SS-21           214.4         115.8         0.6         M=600.6         SS-21           214.4         115.8         0.6         M=600.6         (0.6)         (0.6)           214.4         115.8         0.6         M=600.6         (0.6)         (0.6)         (0.6)           215.2         14.0         5.0         115.0 ft: Hard Drilling/Bit Chatter; SPT Refusal with no panetration at 115.8 ft           208.8         121.4         5.0         115.0 ft: Mard Drilling/Bit Chatter; SPT Refusal with no panetration at 115.8 ft           208.8         121.4         5.0         115.0 ft: Mard Drilling/Bit Chatter; SPT Refusal with no panetration at 115.8 ft           208.8         121.4         5.0         115.0 ft: Mard Drilling/Bit Chatter; SPT Refusal with no panetration at 115.8 ft           208.8         121.4         5.0         2.00         10.05         6.00         10.14           208.8         121.4         10.05         6.00         8.00         10.27				N-5000 0			00.40			2	
1         A +100/L0         SS-20           214.4         115.8         0.6         A+100/L0         SS-21           214.4         115.8         0.6         A+100/L0         SS-21           214.4         115.8         0.6         A+100/L0         SS-22           215.2         115.0 ft: Hard Drilling/Bit Chatter; SPT Refusal with non-pertaining, moderately settlement, while to fight gray, with omange tabling, moderately to moderately weathered, very close to close fracturing, medianing, moderately to moderately weathered, very close to close fracturing, moderately to moderately method.           213.4         116.8         0.6         A+100/K0 (10)/Ft.         RUN 5           213.4         116.8         0.6         A+100/K0 (10)/Ft.         RUN 5           213.8         121.4         0.05         (13.4)         (12.7)           203.8         124.4         0.01         (4.8)         RUN 5           203.8         126.4         0.02         60%         RUN 6           203.8         126.4         0.02         60%         RUN 7           203.8         126.4         0.02         60%         RUN 7           203.8         126.4         0.00         60%         RUN 7           203.8         131.4         50.0         2.00 <td></td> <td></td> <td></td> <td>N=50/0.3</td> <td></td> <td></td> <td>55-18</td> <td></td> <td></td> <td></td> <td></td>				N=50/0.3			55-18				
1         A +100/L0         SS-20           214.4         115.8         0.6         A+100/L0         SS-21           214.4         115.8         0.6         A+100/L0         SS-21           214.4         115.8         0.6         A+100/L0         SS-22           215.2         115.0 ft: Hard Drilling/Bit Chatter; SPT Refusal with non-pertaining, moderately settlement, while to fight gray, with omange tabling, moderately to moderately weathered, very close to close fracturing, medianing, moderately to moderately weathered, very close to close fracturing, moderately to moderately method.           213.4         116.8         0.6         A+100/K0 (10)/Ft.         RUN 5           213.4         116.8         0.6         A+100/K0 (10)/Ft.         RUN 5           213.8         121.4         0.05         (13.4)         (12.7)           203.8         124.4         0.01         (4.8)         RUN 5           203.8         126.4         0.02         60%         RUN 6           203.8         126.4         0.02         60%         RUN 7           203.8         126.4         0.02         60%         RUN 7           203.8         126.4         0.00         60%         RUN 7           203.8         131.4         50.0         2.00 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>2</td> <td></td>										2	
1         A +100/L0         SS-20           214.4         115.8         0.6         A+100/L0         SS-21           214.4         115.8         0.6         A+100/L0         SS-21           214.4         115.8         0.6         A+100/L0         SS-22           215.2         115.0 ft: Hard Drilling/Bit Chatter; SPT Refusal with non-pertaining, moderately settlement, while to fight gray, with omange tabling, moderately to moderately weathered, very close to close fracturing, medianing, moderately to moderately weathered, very close to close fracturing, moderately to moderately method.           213.4         116.8         0.6         A+100/K0 (10)/Ft.         RUN 5           213.4         116.8         0.6         A+100/K0 (10)/Ft.         RUN 5           213.8         121.4         0.05         (13.4)         (12.7)           203.8         124.4         0.01         (4.8)         RUN 5           203.8         126.4         0.02         60%         RUN 6           203.8         126.4         0.02         60%         RUN 7           203.8         126.4         0.02         60%         RUN 7           203.8         126.4         0.00         60%         RUN 7           203.8         131.4         50.0         2.00 <td></td> <td></td> <td></td> <td>1-50/0.0</td> <td></td> <td></td> <td>00.40</td> <td></td> <td></td> <td></td> <td></td>				1-50/0.0			00.40				
214.4         115.8         0.6 <i>N=600.1</i> SS-27           214.4         115.8         0.6 <i>N=600.1</i> SS-27           214.4         115.8         0.6 <i>N=600.0</i> (0.6)         (0.6)         RUN 3           213.8         116.4         5.0         115.0         (1.50)         RUN 4         SS-27           213.8         116.4         5.0         116.0         (1.6)         RUN 4         SS-27           213.8         116.4         5.0         116.0         (1.6)         RUN 4         SS-27           208.8         121.4         5.0         115.0         RUN 5         (1.2)         SS-27           208.8         121.4         5.0         100%         (1.9)         RUN 4         SS           203.8         126.4         3.33         100%         95%         85%         RUN 6           203.8         126.4         3.33         100%         65.0         (13.4)         (12.7)           203.8         126.4         3.33         100%         85%         RUN 6         100%         85%           203.8         126.4         3.30         100%         85%         100%				N=50/0.2			55-19			5-	95.8 ft. Very pale brown (10YR 7/4)
214.4         115.8         0.6 <i>N=600.1</i> SS-27           214.4         115.8         0.6 <i>N=600.1</i> SS-27           214.4         115.8         0.6 <i>N=600.0</i> (0.6)         (0.6)         RUN 3           213.8         116.4         5.0         115.0         (1.50)         RUN 4         SS-27           213.8         116.4         5.0         116.0         (1.6)         RUN 4         SS-27           213.8         116.4         5.0         116.0         (1.6)         RUN 4         SS-27           208.8         121.4         5.0         115.0         RUN 5         (1.2)         SS-27           208.8         121.4         5.0         100%         (1.9)         RUN 4         SS           203.8         126.4         3.33         100%         95%         85%         RUN 6           203.8         126.4         3.33         100%         65.0         (13.4)         (12.7)           203.8         126.4         3.33         100%         85%         RUN 6         100%         85%           203.8         126.4         3.30         100%         85%         100%										E.	
214.4         115.8         0.6 <i>N=600.1</i> SS-27           214.4         115.8         0.6 <i>N=600.1</i> SS-27           214.4         115.8         0.6 <i>N=600.0</i> (0.6)         (0.6)         RUN 3           213.8         116.4         5.0         115.0         (1.50)         RUN 4         SS-27           213.8         116.4         5.0         116.0         (1.6)         RUN 4         SS-27           213.8         116.4         5.0         116.0         (1.6)         RUN 4         SS-27           208.8         121.4         5.0         115.0         RUN 5         (1.2)         SS-27           208.8         121.4         5.0         100%         (1.9)         RUN 4         SS           203.8         126.4         3.33         100%         95%         85%         RUN 6           203.8         126.4         3.33         100%         65.0         (13.4)         (12.7)           203.8         126.4         3.33         100%         85%         RUN 6         100%         85%           203.8         126.4         3.30         100%         85%         100%				N-100/1 0			00.22			51	
Image: Network of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second				14-100/1.0			33-20			57	
Image: Network of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second										5	
Image: Network of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second				N=50/0.1			\$5-21			5	-
214.4         115.8         0.6         N=r000.0         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (1.9)         (1.9)         (1.9)         (1.9)         (1.9)         (1.9)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1) <t< td=""><td></td><td></td><td></td><td>11 00/0.1</td><td></td><td></td><td>00-27</td><td></td><td></td><td>5</td><td></td></t<>				11 00/0.1			00-27			5	
214.4         115.8         0.6         N=r000.0         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (1.9)         (1.9)         (1.9)         (1.9)         (1.9)         (1.9)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1) <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>5</td><td></td></t<>										5	
214.4         115.8         0.6         N=r000.0         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (0.6)         (1.9)         (1.9)         (1.9)         (1.9)         (1.9)         (1.9)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1)         (1.1) <t< td=""><td></td><td></td><td></td><td>N=50/0.1</td><td></td><td></td><td>55-22</td><td></td><td></td><td>R</td><td>-</td></t<>				N=50/0.1			55-22			R	-
214.4         115.8         0.6         M=1000.0 100%         (0.6) 100%         RUN 3 (0.9) (0.9)         (3.5) RUN 4         215.2 45%         HARD ROCK: Gray and while to light gray, with orange staining, moderately severely to moderately meathered, very close to close fracturing, medium hard to moderately mathered.           213.8         116.4         5.0         100%         RUN 4         63%         45%           213.8         121.4         5.0         328         (6.0)         (1.8)         RUN 5         (13.4)         (12.7)           208.8         121.4         5.0         328         (5.0)         (4.8)         RUN 5         (13.4)         (12.7)           208.8         126.4         336         (5.0)         4.8         100%         85%         85%           203.8         126.4         336         (5.0)         4.8         RUN 6         (13.4)         (12.7)         HARD ROCK: Gray and white with trace orange staining, moderately to slightly weathered, very close to moderately close fracturing, moderately to hard, BIOTTE CUARTZ ONEISS           203.8         126.4         3.30         (5.0)         (4.8)         RUN 7         (13.4)         (17.4)         (17.4)         (17.4)         (17.4)         (17.4)         (17.4)         (17.4)         (17.4)         (17.4)         (17.4)											
214.4       115.8       0.6       M=10000       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6)       (0.6) <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>R</td><td></td></td<>										R	
213.8       116.4       5.0       1:40%, 6       100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%, 100%	214.4	115.8	0.6		(0.6)	(0.6)	RUN 3	(3.5)	(2.5)		
208.8         121.4         58%         38%         208.8           208.8         121.4         5.0         228         (5.0)         (4.8)         RUN 5         (13.4)         85%         BS%         BOTTE QUARTZ GNEISS           203.8         126.4         3.30         (5.0)         (4.8)         RUN 6         (13.4)         (12.7)         Weathered, very close to moderately close fracturing, moderately hard to hard, BIOTTE QUARTZ GNEISS           203.8         126.4         3.30         (5.0)         (4.8)         RUN 6         (13.4)         (13.7)         Weathered, very close to moderately close fracturing, moderately hard to hard, BIOTTE QUARTZ GNEISS           203.8         126.4         3.30         (5.0)         (4.8)         RUN 7         (15.0)         (11 joint at 20°, tight; 1 joint at 60°, tight)           198.8         131.4         2.36         (15.0)         (4.0)         RUN 7         (2 joints at 0°, tight to open; 2 joints at 10-20°, tight)           193.8         136.4         2.18         (15.0)         (14.0)         100%         93%         HARD ROCK: Gray and white with trace orange staining, moderately to very slipht weathered, close to moderately close fracturing, moderately to very slipht weathered, close to moderately close fracturing, moderately to very slipht weathered, close to moderately close fracturing, moderately hard to hard, BIOTTTE QUARTZ GNEISS	213.8	116.4	5.0	2:38			RUN 4		1070		to moderately hard, BIOTITE QUARTZ GNEISS
Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code         Code <thcode< th="">         Code         Code         <thc< td=""><td></td><td></td><td></td><td>1:26 3:47</td><td></td><td></td><td></td><td></td><td></td><td></td><td>(5 joints at 0°, tight; 3 joints at 30°, tight)</td></thc<></thcode<>				1:26 3:47							(5 joints at 0°, tight; 3 joints at 30°, tight)
100         320 125 125 125 125 125 125 125         100% 125 125 125         26% 125 125 125         89% 125         85% 125         weathered, very close to moderately close fracturing, moderately hard to hard, 1900 to moderately close fracturing, moderately hard to hard, 1910 TH QUARTZ GNEISS (1 joint at 30°, tight)           198.8         131.4         2:35         100%         96%         RUN 6           198.8         131.4         2:35         100%         68%         62%         100%           198.8         131.4         2:35         100%         89%         100%         100%         100%           193.8         136.4         2:18         100%         80%         114.0         193.8         136.4         2:18         100%         80%         115.0         114.0         193.8         193.8         141.4         3:55         100%         80%         110.0         140.0         193.8         141.4         3:55         100%         100%         93%         193.8         146.4         3:00         100%         100%         93%         193.8         146.4         3:00         100%         100%         100%         100%         100%         100%         100%         100%         100%         100%         100%         100%         100%	208.8	121.4		2:26	(5.0)	(4.8)	RUN 5	(13.4)	(12.7)		
203.8       126.4       3:30			0.0	3:20 4:54						$\gg$	weathered, very close to moderately close fracturing, moderately hard to hard,
LUS.8         126.4         3.00         (5.0)         (4.8)         RUN 6           198.8         131.4         2.36         -         -         -         (1 joint at 20°, tight; 1 joint at 60°, tight)           198.8         131.4         2.36         -         -         -         -         -           198.8         131.4         2.36         -         -         -         -         -         -           193.8         136.4         2.241         (3.4)         (3.1)         RUN 7         -         -         -         -           193.8         136.4         2.241         (5.0)         (4.0)         RUN 8         (15.0)         14.0         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         - <td></td> <td></td> <td></td> <td>2:13</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>				2:13							
198.8       131.4       2324 236       100%       96% 236	203.8	126.4			(5.0)	(4.8)	RUN 6	-		<b>W</b>	
198.8       131.4       2:36					100%						
13.8       13.6.4       2:41       (3.4)       (3.1)       RUN 7         193.8       136.4       2:18       62%       RUN 8       193.8         193.8       136.4       2:18       100%       80%       115.0         193.8       141.4       3:55       100%       80%       100%       100%         188.8       141.4       3:55       100%       100%       100%       100%         183.8       146.4       3:00       (5.0)       (5.0)       (5.0)       100%         183.8       146.4       3:00       (5.0)       (5.0)       100%       100%         178.8       151.4       5:50       (5.0)       (5.0)       RUN 10       100%         178.8       151.4       5:50       100%       100%       100%       100%         178.8       151.4       5:50       100%       100%       100%       178.8	100.0	104.4		2:36						WA	-
133.8         136.4         2:00 2:20 2:18         0:00 2:20 2:18         RUN 8 80%         (15.0) 100%         14.0) 93%         HARD ROCK: Gray and white with trace orange staining, moderately to very slightly weathered, close to moderately close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS (9 joints at 40°, tight; 1 joint at 60°, tight)           188.8         141.4         3:55         (5.0)         (5.0)         RUN 9           188.8         141.4         3:55         (5.0)         (5.0)         RUN 9           188.8         141.4         3:55         (5.0)         (5.0)         RUN 9           183.8         146.4         3:00         (5.0)         RUN 10         (1 joint at 20°, open)           183.8         146.4         3:00         100%         100%         RUN 10         (2 joints at 20-30°, tight)           178.8         151.4         5:50         I         I         I         I         I	190.0	131,4		2:41			RUN 7	1			(2 joints at 0°, tight to open; 2 joints at 10-20°, tight)
193.8       136.4       2:20       193.8       136.4       136.4       136.4       136.4       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       193.8       141.4       3:55       100%       80%       100%       100%       100%       93%       93%       93%       93%       93%       93%       93%       93%       93%       100%       100%       100%       100%       93%       93%       93%       93%       93%       93%       93%       93%       100%       100%       100%       100%       100%       100%       93%       100%       100%       100%       100%       100%       100%       100%       100%       100%       100%       100%       100%       100%       100%       100%       100%       100%       100%       100%       100%       100%       100%       100%       100%       100%					68%	62%					
100         5.0         2:44 2:34 3:15 3:19         (5.0)         2:44 100%         (6.0)         RUN 8 80%         (14.0)         HARD ROCK: Gray and white with trace orange staining, moderately to very slightly weathered, close to moderately close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS (9 joints at 40°, tight; 1 joint at 60°, tight)           188.8         141.4         3:55         (5.0)         (5.0)         RUN 9           188.8         146.4         3:00         100%         RUN 9           183.8         146.4         3:00         100%         RUN 10           188.8         141.4         5:0         3:35 (5.0)         (5.0) 100%         RUN 9           183.8         146.4         3:00         100%         RUN 10         (2 joints at 20-30°, tight)           178.8         151.4         5:50         100%         100%         100%	103.8	136.4								<b>B</b>	- 193.8 1
188.8       141.4       3:15 3:19 3:19 3:55       hard, BIOTITE QUARTZ GNEISS (9 joints at 40°, tight) (1 joint at 20°, open)         188.8       141.4       5.0       4:27 4:45 2:08 4:00       (5.0) 4:45 2:08 4:00       (5.0) 100%       RUN 9         183.8       146.4       3:00       (5.0) 4:18 6:20       (5.0) 4:18 6:20       (5.0) 100%       RUN 10         178.8       151.4       5:50       100%       100%       100%         178.8       151.4       5:50       100%       100%		100.4		2:44			RUN 8		(14.0)		HARD ROCK: Grav and white with trace orange staining, moderately to very
188.8       141.4       3:55				3:15	100%	00%		100%	93%	VIA	hard, BIOTITE QUARTZ GNEISS
183.8       146.4       5.0       4:27 4:45 2:08       (5.0) 100%       RUN 9         183.8       146.4       3:00       100%       100%       100%       100%         183.8       146.4       3:00       100%       100%       100%       100%       100%         183.8       146.4       3:00       100%       100%       100%       100%       100%       100%         178.8       151.4       5:50       5:50       178.8       178.8       178.8       178.8	188.8	141,4		3:55							(9 joints at 40°, tight; 1 joint at 60°, tight)
183.8     146.4     100 %     100 %     100 %       183.8     146.4     3:00     -     -       183.8     146.4     3:00     -     -       183.8     146.4     100 %     100 %     100 %       178.8     151.4     5:50     -     -       178.8     151.4     5:50     -     -       178.8     151.4     5:50     -     -							RUN 9				(1 joint at 20°, open)
183.8       146.4       3:00       -       -       (2 joints at 20-30°, tight)         183.8       100%       100%       100%       100%       100%       -       -         178.8       151.4       5:50       -       -       -       -       -         178.8       151.4       5:50       -       -       -       Boring and coring terminated at 151.4 feet.         Boring closed by tremie method with cement-bentonite grout.       -       Boring closed by tremie method with cement-bentonite grout.				2:08	10076	100 %					
4:18         100%         100%           4:45         6:20         178.8           151.4         5:50         178.8	183.8	146.4		3:00							
4:45 6:20     178.8       178.8     151.4       5:50     178.8       Boring and coring terminated at 151.4 feet.       Boring closed by tremie method with cement-bentonite grout.			5.0				RUN 10				(2 joints at 20-30°, tight)
178.8       178.8         -       Boring and coring terminated at 151.4 feet.         -       Boring closed by tremie method with cement-bentonite grout.				4:45	10070	10070					
Boring closed by tremie method with cement-bentonite grout.	178.8	151.4									
depth of 146.4 feet.											24 hour water level measured on 9/21/2009 prior to drilling. Borehole was at a

Volume 1, Revision 0

Page 147 of 542

DCN NAP307

North Anna 3 Project MACTEC Project No. 6468-09-2473



### M-27 – Box 1

North Anna 3 Project	Ewin	Lager	8.90		-
6465-04-2473	4 (144-1414)	5.0°(100%)	4.0 (802)		18
· Ening M-LT	((HIA, -HPA, )	5.2 (100's) server	2:1. (UX)	T	and an
Bon Z Dapth 1362-151.4'	• 10 (HE4-1514')	5.1' (1007.) Sector	2.1. (100%)		
Naturbed Aufortune Constantion Andretaka	. Catricast state	Late an englished of	ant at a to the tarte at	Landstand of solid	
			S		5.0
ALL AND ANY ALLOSS	· · · ·				
Contraction and the second second second		1.			
Marine and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s	di la			and a second	
<ul> <li>Application of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the</li></ul>	100				

M-27 – Box 2



GEOTECHNICAL BORING LOG Prepared By JSJ Date 12/09/09

Checked By Mgr Date 12/16/09

BECHT	EL PRO	JECT N	10.: 25	5161		MACTEC F	ROJECT NO.	: 6468	-09-2473	3 (	COUNT	Y: L	ouisa, VA GEO	DLOGIST: E		
SITE D	ESCRIP	TION: N	North A	Anna 3 I	Proje	ct Suppleme	nt 2			1	DRILLE	R: D.	. Rhodes/K. Guy		FLUID LE	VEL (ft)
BORIN	G NO.:	M-28				DRILL MET	THOD: Mud R	otary/F	Rock Co	re I	ORILL N	MACH	HINE: CME-45C Trac	k (RAL)	0 HR.	NA
ROUN	D ELE	V.: 308	3.2 ft	(NAV	D88)	NORTHING	3,909,636	US	ft (NAD	83) E	ASTIN	G:	11,685,672 US	ft (NAD83)	24 HR.	24.5
OTAL	DEPTH	: 150.0	) ft §	SAMPLE	EMET	THODS: AST	M D 1586-08a	; 2488	-09a; 21	13-08	3; 6032-	-08	ROD TYPE: AWJ	HAMMER (I	D):140-lb. A	uto (MEC-
ATES	TARTE	D: 9/1	0/09	COM	PLET	ED: 9/13/09	HOLE DIA	: 3"	CASIN	IG DE	PTH: 2	1.6 ft	t CORE SIZE: NQ3	BITS USE	D: 2-7/8" Tri	-Cone
LEV.	DEPTH	BLC	ow co	UNT		BLC	WS PER FOO	Г		SAM	· V/	LO	SOIL	ND ROCK DE	ESCRIPTION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40 60	80	100	NO.	MO		50127	ND NOON DI	LOGNETION	
08.2					*	Cr	ound Surface						200.0			
10.2	_	1	-	1	-	GI			1011	-	1		308.2 No sampling	from 0.0 to 7	.6 feet due to s	soft dig
-					33	• • • • • = •			1111 1111				utility cleara	nce by Domini	ion Personnel	
-																
00.6	- 7.6												- 300.6			
-	-	5	5	4	101	•				SS-1			- RESIDUAL	SOIL: Well Gr	aded SAND (S	SW),
8.1	10.1	6	12	18						SS-2	-		coarse grain	ed sand, trace	e of organic ma	
95.4 -	- 12.8					30			1.4.4		_		relict rock fa		ND (SM), brow	whish
-	-	15	19	25						SS-3	-		vellow (10Yi	R 6/6), mediun	n dense, mois ace mica, relic	t, fine
2.6 -	- 15.6	25	47	53/0.4				-	-	SS-4			fabric		10YR 7/3), den	
39.4-	- 18.8								100/0.9				12.6 ft: Very		io in ha), den	30
	2	12	10	55	1.		•			SS-5				drilling		
-	2		( T)					1				N	WEATHER	ED ROCK: Se	verely weather	red
4.4 -	- 23.8	50/0.0					******		50/0.	SS-6			284.0 23.0 ft: Very	hard drilling	SS - Not sampl	1-
-		50/0.0				* * * * * * *	*******	* * * *	50/0.0	SS-7					HERED ROCK	
1							******	i e e e L e e e					no penetrati	on)		
-	-					******	******	( ) ( ) ( ) ( )	***			谣	gray to light	brown, with or	HERED ROCK range staining,	
-	-								1.1				weathered z	ones, very clo	athered, with some to moderate	ely
-														ing, medium h TE QUARTZ (	hard to modera GNEISS	ately
-	-				1.1		******									
-	-				8.6		*******						-			
-	-						******					法				
1	-					******										
-	-						******						HARD ROC	K: Light gray v	with orange sta	aining,
-	-											2	slightly weal moderately	hered to fresh hard to very ha	ard, BIOTITE	ing,
							*****						QUARTZ G	NEISS		
-	-												F			
-	-		1				+ + + + + +		+ 3 X							
4	2		i		1.3								F			
9												VIII	Ŧ			
	-		ľ.		4.4								1			
1	-												-			
1	5						******									
1	1				1.5		* * * * * *						1			
1						* * * * * * *	* * * * * * * *					VIII	1			
3							******									
							* * * * * * *	1 1 X 1					t			
	2					******	******						ł			
-	-												1			
1			-				4 + + + + + + + + + + + + + + + + + + +		1	-		VIII	1			





SHEET 2 OF 3

DECUT		IFOT	10.07	4.04		MACTEO	00		6400	00.047	. 1	COLINITO		SHEET 2 OF 3 Louisa, VA GEOLOGIST: B. Mabie
	TEL PRO							OJECT NO.	0468	-09-247				
			North A	Anna 3 P	rojec	t Supplem								D. Rhodes/K. Guy FLUID LEVEL (ft)
	IG NO.:							OD: Mud Ro						CHINE: CME-45C Track (RAL) 0 HR. NA
GROU	ND ELEV	/.: 30	8.2 ft	(NAV	D88)	NORTHIN	IG:	3,909,636	US	ft (NAD	083)	EASTIN	G:	11,685,672 US ft (NAD83) 24 HR. 24.5
TOTAL	DEPTH	: 150.	0ft S	SAMPLE	MET	HODS: AS	STM	D 1586-08a	; 2488	-09a; 21	113-0	8; 6032-0	08	ROD TYPE: AWJ HAMMER (ID):140-Ib. Auto (MEC-
DATE	STARTE	D: 9/1	0/09	COMP	PLETE	ED: 9/13/0	9	HOLE DIA	.: 3"	CASI	NG D	EPTH: 2	1.6 f	ft CORE SIZE: NQ3 BITS USED: 2-7/8" Tri-Cone
ELEV.	DEPTH	BL	ow co	UNT		BL	.OW	S PER FOOT	Г		SAM	IP. 💙/	L	SOIL AND ROCK DESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	NO	. MOI		
000 4					•	Continuu	ad fr	om proviou						
233.4						Continue	ea tr	om previou	s page				<u></u>	HARD ROCK: Light to dark gray, moderately to
-	t												$\gg$	slightly weathered, close fracturing, moderately
-	+													hard, QUARTZ BIOTITE GNEISS
	‡													¥
	t					* * * * * *		* * * * * * *						X:
_	F						• •							*
	‡												K	HARD ROCK: Light gray to gray, with orange
	t													staining, moderately to slightly weathered,
_	F						• •							close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS
	t													
	+												***	
_	Į.												$\gg$	×
	t						1						KK	
	+						• •						$\gg$	»}-
_	‡					* * * * *								
	t					* * * * * *							$\gg$	
	Ŧ													&-
1	‡												$\gg$	
	t													203.2 1
	+				• •		• •							HARD ROCK: Light gray to gray, with orange staining, moderately to slightly weathered,
_	<b>†</b>													close to very close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS with
	t												$\otimes$	zones of WEATHERED ROCK: BIOTITE
	Ŧ						11							QUARTZ GNEISS
_	‡												$\otimes$	
	÷				::		: :							
	Ŧ					* * * * *	• •	* * * * * *					$\otimes$	×
-	<b>‡</b>													4
1	t				::		: :							188.2 1
	+						• •							HARD ROCK: Gray with orange staining, moderately to very slightly weathered, close
_	‡				1.1									fracturing, moderately hard to hard, BIOTITE
	t						: :							QUARTŽ GNEISS
	Ŧ						• •							
2	‡				1		: :							×
	t						::	*****						
	Ŧ													*
_	1						::							
	t						::						$\gg$	×
	Ŧ													4
	‡						: :						$\gg$	
	t		1		1.1		: :						$\mathbb{K}$	
	Ŧ						• •						$\gg$	
	‡						: :						$\otimes$	
	+				1									*
	Ŧ												$\leq$	SF
	t				1.1								$\gg$	
	Į						2						KK	(4

Volume 1, Revision 0

# GEOTECHNICAL BORING LOG



SHEET 3 OF 3

	L PROJE				4	MACTEC PR		6468	-09-2473			_		GEOLOGIST: E		
			orth A	nna 3 P	rojec	t Supplement				_			. Rhodes/K. Gu			EVEL (ft)
	NO.: M					DRILL METH				-		_	HINE: CME-45C		0 HR.	NA
ROUND	ELEV .:	308.				NORTHING:						-	11,685,672	US ft (NAD83)	24 HR.	24.5
OTAL D	DEPTH:	150.0	ft S.	AMPLE	MET	HODS: ASTM	D 1586-08a;	2488	1	A	_		ROD TYPE: AV			
ATE ST	ARTED:	9/10	/09	COMP	LETE	ED: 9/13/09	HOLE DIA.	: 3"	CASIN	G DEP	TH: 21	.6 ft	t CORE SIZE:	NQ3 BITS USE	D: 2-7/8" Ti	i-Cone
LEV. D			W COL				S PER FOOT			SAMP.		D	S	OIL AND ROCK D	ESCRIPTION	
(ft)	(ft) (	0.5ft	0.5ft	0.5ft	0	20 44	0 60	80	100	NO.	MOI	G				
58.6	_					Continued f	rom previous	s page				1.				
T										-		000	Boring	and coring termina	ted at 150.0 f	set.
İ														closed by tremie m	nethod with	
t														t-bentonite grout.		
***************************************														r water level measu drilling. Borehole eet.		



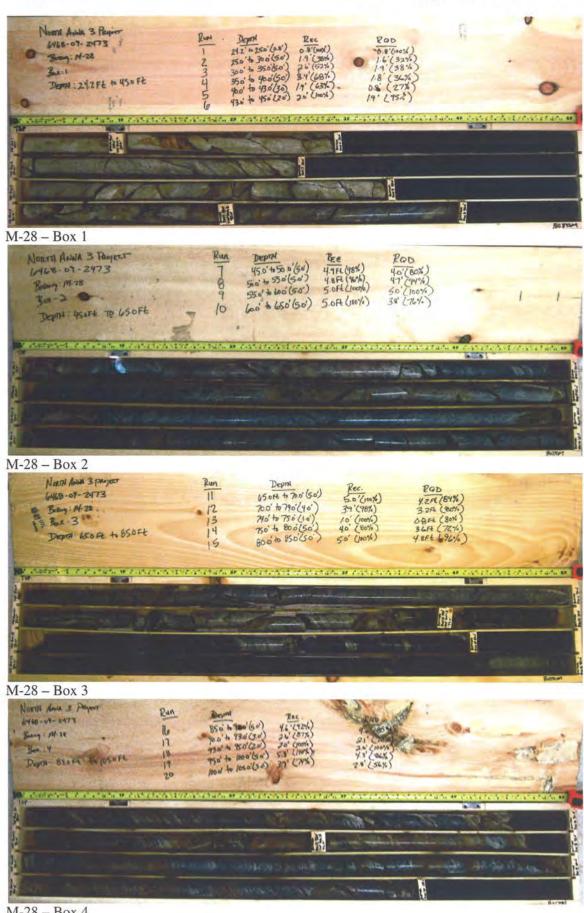
BECHT	EL PRO	JECT	NO.: 2516	61	N	ACTEC	PROJE	ECT N	0.: 64	68-09-2473 COUNTY: Louisa, VA GEOLOGIST: B. Mabie
SITE DI	ESCRIPT	TION:	North An	na 3 Pr	oject S	Supplem	ent 2			DRILLER: D. Rhodes/K. Guy FLUID LEVEL (
BORIN	G NO.:	M-28			D	RILL ME	THOD	: Mud	Rota	y/Rock Core DRILL MACHINE: CME-45C Track (RAL) 0 HR. N
GROUN	ND ELEV	.: 3	308.2 ft	(NAV	088) N	ORTHIN	G: 3,	909,63	36	US ft (NAD83) EASTING: 11,685,672 US ft (NAD83) 24 HR. 24
TOTAL	DEPTH:	150	.0 ft	SAM	PLE M	ETHODS	ASTN	/I D 15	86-08	a; 2488-09a; 2113-08; 6032-08 HAMMER (ID): 140-lb. Auto (MEC-1
DATE S	TARTE	D: 9/	10/09	COM	PLETE	D: 9/13/	09	CASIN	IG DE	PTH: 21.6 ft CORE BARREL TYPE: Wireline NQ3 Triple Tube, series 6 bit
				1						
	DEPTH	RUN	DRILL	RU		SAMP.		ATA	L	
ELEV. (ft)	(ft)	(ft)	RATE (Min/ft)	REC. (ft) %	RQD (ft)	NO.	REC. (ft)	RQD (ft) %	O G	DESCRIPTION AND REMARKS
			(11111)	70			/0	70		
		0.0	N=50/0.0	(0.0)	(0.0)	BUN 1	(10.6)	(6.0)		Begin Coring @ 24.2 ft 284.0 HARD ROCK and WEATHERED ROCK: Light gray to light brown, with orange
284.0 283.2	24.2 25.0	0.8	N=50/0.0 1:49/0.8	(0.8)	(0.8)	RUN 1 RUN 2	(10.6) 56%	(6.9) 37%		staining, severely to moderately weathered, with slightly weathered zones, very
		0.0	2:35 2:30	(1.9)	(1.6)					close to moderately close fracturing, medium hard to moderately hard, BIOTITE QUARTZ GNEISS
278.2	30.0		1:31 0:25	38%	32%					(Several fractures at 80-90°, 1 joint at 70°, open)
210.2	50.0	5.0	1:08 1:46	(2.6)	(1.9)	RUN 3				(3 joints at 30-50°, tight; 1 joint at 80°, tight)
			2:32 2:08	52%	38%					
273.2	35.0		2:02 2:39							
L. Q. L	00.0	5.0	2:48 2:06	(3.4)	(1.8)	RUN 4				(Abundant open fractures 20-60° and 80-90°)
			1:58	68%	36%					-
268.2	40.0		2:15 2:00							
LUUIL		3.0	2:30 2:39	(1.9)	(0.8)	RUN 5				(Abundant open fractures 0-90°)
265.2	43.0		6:34	63%	27%					265.2
263.2	45.0	2.0	2:43 2:56	(2.0)	(1.9) 95%	RUN 6	(31.6) 99%	(27.6) 86%		<ul> <li>HARD ROCK: Light gray with orange staining, slightly weathered to fresh, close fracturing, moderately hard to very hard, BIOTITE QUARTZ GNEISS</li> </ul>
		5.0	3:02 2:57	(4.9)	(4.0)	RUN 7				(2 joints at 20-30°, tight)
			3:04	98%	80%					(2 joints at 0°, tight; 5 joints at 20-50°, tight to open)
258.2	50.0		3:07 3:36							
		5.0	4:38 5:16	(4.8) 96%	(4.7) 94%	RUN 8				(4 joints at 20-60°, tight to open; vertical fractures at 80-90°)
			4:49	90%	9470					-
253.2	55.0		5:18 5:23							
		5.0	3:46 3:43	(5.0)	(5.0) 100%	RUN 9				(4 joints at 40-50°, tight; 1 joint at 70°, open)
			3:49 4:42	10070	10070				$\gg$	-
248.2	60.0		5:32							
		5.0	5:17 5:48	(5.0)	(3.0) 60%	RUN 10				(5 joints at 30-40°, open; 3 joints at 60-70°, open; 1 joint at 80-90°, open; all with orange staining)
			7:25 4:48							-
243.2	65.0		6:32	1.0		DUBLIC				
		5.0	4:13 3:45	(5.0) 100%	(4.2) 84%	RUN 11				(4 joints at 20-40°, open; 3 joints at 70-80°, tight)
			3:48 3:50							-
238.2	70.0	4.0	4:39	(2.0)	(2.0)	RUN 12				(2 joints at 20, 20° apont 4 joints at 40, 50° apont 4 joint at 80° apont all with
		4.0	3:09	(3.9) 98%	(3.2) 80%	KUN 12				(2 joints at 20-30°, open; 4 joints at 40-50°, open; 1 joint at 80°, open; all with orange staining)
234.2	74.0		3:34 3:38							-
233.2		1.0	3:26 2:50	(1.0)	(0.8)	RUN 13 RUN 14	(9.0)	(8.4)		(1 joint at 80°, open with trace clay and orange staining)
		5.0	2:40	(4.0)	(3.6)	14	90%	84%		HARD ROCK: Light to dark gray, moderately to slightly weathered, close
			2:37 2:07	80%	72%					<ul> <li>fracturing, moderately hard, QUARTZ BIOTITE GNEISS</li> </ul>
228.2	80.0	5.0	2:24	(5.0)	(4.8)	RUN 15				(7 joints at 20-50°, tight to open; 1 joint at 90°, open with trace clay)
			1:48 2:04	100%	96%					A summary set of a set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the set of the
0000	0.5.0		2:21							-
223.2	85.0	5.0	2:16 2:33	(4.6)	(4.0)	RUN 16	(18.2)	(15.2)		ARD ROCK: Light gray to gray, with orange staining, moderately to slightly
			2:54 3:26	92%	80%		91%	76%		weathered, close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS
040.0	00.0		2:08							(4 joints at 70-80°, tight to open)
218.2	90.0	3.0	2:33 2:46	(2.9)	(2.1)	RUN 17				(Abundant high angle fractures at 70-90°)
215.2	93.0		2:23 3:18	97%	70%					Recovered 0.3 ft of RUN 17 with RUN 18
213.2		2.0	3:06 3:20	(2.0)	(2.0)	RUN 18	1		1//	(1 joint at 90°, tight)
613.2	95.0	5.0	3:17	100%	(4.3)	RUN 19	1			Recovered 0.3 ft of RUN 18 with RUN 19 (10 joints at 50-60°, tight to open)
			2:57 2:50	100%	86%				V///	Recovered 0.3 ft of RUN 18 with RUN 19



SHEET 2 OF 2

										SHEET 2 OF 2
			NO.: 2516					ECT N	0.: 6	468-09-2473 COUNTY: Louisa, VA GEOLOGIST: B. Mabie
SITE DI	ESCRIP	TION:	North An	na 3 Pr						DRILLER: D. Rhodes/K. Guy FLUID LEVEL (ft)
BORIN	g NO.:	M-28				RILL ME	THOD	: Mud	Rota	ary/Rock Core DRILL MACHINE: CME-45C Track (RAL) 0 HR. NA
GROUN	ND ELEN	/.: :	308.2 ft	(NAVI	088) N	IORTHIN	G: 3,	909,63	36	US ft (NAD83) EASTING: 11,685,672 US ft (NAD83) 24 HR. 24.5
TOTAL	DEPTH	: 150	.0 ft	SAM	PLE M	ETHODS	: ASTN	/I D 15	86-08	8a; 2488-09a; 2113-08; 6032-08 HAMMER (ID): 140-Ib. Auto (MEC-12)
DATE S	STARTE	D: 9/	/10/09	COM	PLETE	D: 9/13/	09	CASIN	IG D	EPTH: 21.6 ft CORE BARREL TYPE: Wireline NQ3 Triple Tube, series 6 bit
ELEV.	DEPTH		DRILL	REC.	RQD	SAMP.	REC.	RQD	L	DESCRIPTION AND REMARKS
(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	G	
										Continued from previous page
208.2	100.0	5.0	2:37 2:27	(3.7)	(2.8)	RUN 20	-			HARD ROCK: Light gray to gray, with orange staining, moderately to slightly weathered, close fracturing, moderately hard to hard, BIOTITE QUARTZ
		5.0	2:33	74%	56%					GNEISS (continued)
000.0	105.0		1:49							(6 joints at 50-60°, open)
203.2	105.0	4.6	3:23	(2.2)	(1.0)	RUN 21	(7.6)	(3.6)		HARD ROCK: Light gray to gray, with orange staining, moderately to slightly
			2:40 2:35	48%	22%		51%	24%		weathered, close to very close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS with zones of WEATHERED ROCK: BIOTITE QUARTZ
198.6 198.2	109.6		1:48	(0.1)	(0.0)	RUN 22				GNEISS (4 joints at 30-50°, open with trace clay)
190.2		5.0	1:12/0.4 2:15	25%	0%	RUN 23				(6 joints at 30-50°, open)
			1:52 2:33 3:41	(1.3) 26%	(0.4) 8%					
193.2	115.0	4.0	4:16	(3.5)	(2.2)	RUN 24				(6 joints at 40-50°, tight top open with orange staining and clay; 2 joints at 60°,
			3:01 2:37	88%	55%					open with trace clay and orange and brown staining)
189.2 188.2		1.0	3:30 3:03	(0.5)	(0.0)	RUN 25				188.2 (1 joint at 50°, open with trace orange staining)
		5.0	2:20 2:55	(4.3)	(3.3)	RUN 26	(29.1) 97%	(26.8) 89%	)	HARD ROCK: Gray with orange staining, moderately to very slightly weathered, close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS
			3:21 3:17	86%	66%					<ul> <li>(3 joints at 10-20°, open with trace clay and orange staining; 3 joints at 50-60°,</li> </ul>
183.2	125.0	5.0	3:12 2:57	(4.8)	(4.5)	RUN 27	-		$\gg$	tight to open with clay and orange staining) (3 joints at 10-20°, tight with trace orange staining; 3 joints at40-50°, tight to
			2:41 2:47	96%	90%					open with orange staining; 3 joints at 60-70°, tight to open with trace orange staining)
178.2	130.0		2:45 3:23							
		5.0	2:51 3:07	(5.0)	(4.8) 96%	RUN 28	1			(7 joints at 40-50°, tight to open with trace orange staining)
			3:17 4:12	10070	0070					
173.2	135.0	5.0	3:03 3:25	(5.0)	(4.7)	RUN 29	-		$\langle \rangle \rangle$	(4 joints at 30-40°, tight to open with orange staining; 2 joints at 60-70°, open to
		0.0	3:14 3:23	100%						tight with trace clay and brown staining)
168.2	140.0		3:18 3:23							
100.2	140.0	5.0	3:06 2:56	(5.0) 100%	(4.6) 92%	RUN 30	1			(5 joints at 20-30°, tight to open with orange staining; 1 joint at 80°, open)
			2:53	100%	52.70					
163.2	145.0	5.0	2:45	(5.0)	(4.9)	RUN 31	-			(4 joints at 30-40°, tight to open; 2 joints at 80°, tight with trace clay)
		0.0	2:26	100%						
158.2	150.0		2:49							158.2
100.2	100.0									Boring and coring terminated at 150.0 feet.
										Boring closed by tremie method with cement-bentonite grout.
										24 hour water level measured on 9/13/2009 prior to drilling. Borehole was at a
										_ depth of 115.0 feet.
										-
										-
										<u>L</u>
										È.
										Ł
										E
										E
										F
										Ε

North Anna 3 Project MACTEC Project No. 6468-09-2473



M-28 – Box 4

## North Anna 3 Project MACTEC Project No. 6468-09-2473



#### M-28 - Box 5

North And Springer 1068-09-2073 Bang-A-28 Ban-6 Depni: 1250FE to 1450FE	Run 27 27 29 30	Dep74 125.6° + 190.0° (50°) 1300° + 133.0° (50°) 135.0° +0 140.0° (50°) 140.0° +0 145.0° (50°)		RQD 45H(90%) 45H(14%) 47A (94%) 4(H (92%)	in
			and the second	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s	

## M-28 – Box 6

Notern Anne 3 Augert Last-2+7473 Bang Mars Bor-7 Bager Mars In Islance	Run 31	Dep74 1450'-150.0'(50)	4	ZQD 49/(98%)	:
And And And And And And And And And And	12-7-24 fty 18 1-2-22	CAM (CAVITAR, W.C.)	and a start of the	and a construction	Tor your drive and
					- stands-
Participation of the second second				P. Lawrence	
N NO		10 700	CAR -		
	The second second	1 1 1 1 1 1	10.0	1	12
	and the second second	and the second second second		-	Roman

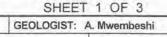


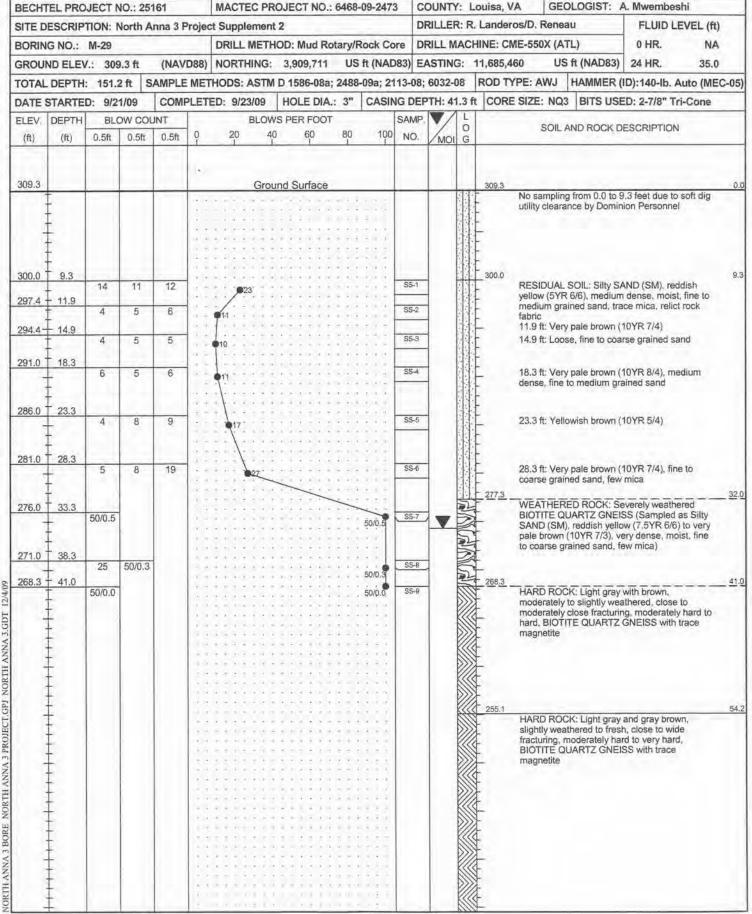


GEOTECHNICAL BORING LOG

Prepared By JJJ Date 12/16/09

Checked By MBL Date 12/16/09







															the second second second second second second second second second second second second second second second s	2 OF 3		
BECH	TEL PRO	DJECT	NO.: 25	5161		MACTEC PR	OJECT NO .:	6468-	09-2473		the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s	_	ouisa, VA			A. Mwembes	shi	
SITE D	DESCRIP	TION: I	North /	Anna 3 F	Projec	ct Supplement	t 2				RILLER	R: R.	. Landeros/D.	Reneal	1	FLUID L	EVEL (fi	t)
	IG NO.:					1	OD: Mud Ro	ary/R	Rock Co	re D	RILL M	ACH	HINE: CME-550	OX (AT	_)	0 HR.	NA	4
	ND ELE		9.3 ft	(NAV	D88)	NORTHING:		_					11,685,460		ft (NAD83)	24 HR.	35.	0
_	DEPTH					HODS: ASTM							ROD TYPE: A			ID):140-lb. /	Auto (ME	-C-
	STARTE					ED: 9/23/09	HOLE DIA.:				PTH: 4					D: 2-7/8" T		
LEV.	1		ow co	_			S PER FOOT		o/ toll	SAMP	1	L					- conc	
		0.5ft	0.5ft	0.5ft	0	20 40		80	100	NO.	1/	0		SOIL A	ND ROCK D	ESCRIPTION	1	
(ft)	(ft)	0.51	0.51	0.51	1					110.	MOI	G						
234.5						Continued f	rom previous	page	9									
	İ												HARI	D ROCK	: Light gray	and gray brow h, close to wid	vn,	
	t				1::								+ fractu	uring, ma	oderately har	d to very hard		
-	Ŧ														ARTZ GNEIS ontinued)	SS with trace		
	‡												Ŧ					
	t				1.1													
	+				1::													
	Ŧ				::													
	ŧ												Ŧ					
	‡				1							V]]						
	t				1.1	******							*					
	+				::								_					
	Ŧ												-					
	‡				111								ŧ					
	±				1::													
	+				1::	* * * * * * * *			· · · ·									
	Ŧ				::								ł					
	Ŧ											$\leq$	⊊					
	‡				1::							V)/	Í.					
	±				1::								ŧ					
	+				1 : :													
	Ŧ						* * * * * *						Ŧ					
	‡												ŧ					
	t				1::			· · ·					1					
	Ŧ				11								ł					
	Ŧ							• • •					Ŧ					
	<b>‡</b>				1							$\leq$	₹					
	t							· · · ·					t					
	t				1								1					
	Ŧ											V//	F					
	‡				1.								Ţ.					
	1												Ł					
	ł				1.								ł					
	Ŧ												ł					
	1				1.								1					
	t				1.			· · ·					1					
	+												ł					
	Ŧ											$\ $	₽					
	1											$\gg$	1					
	t											$\leq$	£					
	Ŧ											$\langle \rangle \rangle$	1					
	‡	1											ξ.					
	t												t					
	+				· ·							011	¥					



SHEET 3 OF 3

ECHI	EL PRO	JECT N	NO.: 2	5161		MACTEC P	ROJECT NO .:	6468	-09-2473	C	OUNTY	: L	ouisa, VA GEOLOGIST: A	3 OF 3 A. Mwembeshi
					roie	ct Supplemen							Landeros/D. Reneau	FLUID LEVEL (ft)
	G NO.:					1	HOD: Mud Ro	otarv/F	Rock Co	-			HINE: CME-550X (ATL)	0 HR. NA
1.1.1.1	ND ELEN	-	3.8	(NAV	(D88)		: 3,909,711			-		_	11,685,460 US ft (NAD83)	
1.20	DEPTH						M D 1586-08a;					-		ID):140-Ib. Auto (MEC-
	STARTE			-		ED: 9/23/09	HOLE DIA.		-	_	_	-		D: 2-7/8" Tri-Cone
LEV.	DEPTH	1	DW CC	_	L		WS PER FOOT		1	SAMP	1	L	DITO OCL	.D. 2-110 111-00110
(ft)	(ft)	0.5ft	0.5ft	1	0		40 60	80	100	NO.	MOI	0 G	SOIL AND ROCK D	ESCRIPTION
()	1.4			1 2/2/4			1	-	-		VIVIOI	0		
					*									
59.7			-	-		Continued	from previous	spage	B	-	-	m		
		-	-	-						-	-	111.	158.1 Boring and coring termina	ted at 151.2 feet.
	-												Boring closed by tremie m	
-	F												cement-bentonite grout.	(
	Ē.												24 hour water level measi	ured on 9/23/2009
-													<ul> <li>prior to drilling. Borehole</li> <li>139.2 feet.</li> </ul>	was at a depth of
	t													
	-												-	
-	+													
	F												-	
1	Ē.												-	
	t.													
	t												-	
	E .												-	
	F		1											
	F												-	
1	ŧ.													
1	-													
	-													
	-		1										-	
	t													
	F													
	F													
	ŧ.													
	t													
	t													
	-													
-	F													
	ţ.													
	t												-	
1	t												5	
	t													
	Ŧ												-	
1	Ŧ													
	1												-	
	t												-	
	F												-	
	ţ												-	
	1												-	
13	ł													
	F												-	
	+													



BECHT	TEL PRO	JECT	NO.: 2516	61	IV	IACTEC	PROJE	ECT N	0.:6	468-09-2473 COUNTY: Louisa, VA GEOLOGIST: A. Mwembeshi
SITE D	ESCRIP	TION:	North An	na 3 Pr	oject S	Supplem	ent 2			DRILLER: R. Landeros/D. Reneau FLUID LEVEL (ft)
BORIN	G NO.:	M-29			D	RILL ME	THOD	: Mud	Rota	ary/Rock Core DRILL MACHINE: CME-550X (ATL) 0 HR. NA
GROU	ND ELEV	.: 3	309.3 ft	(NAVE	088) N	ORTHIN	G: 3,	909,71	11	US ft (NAD83) EASTING: 11,685,460 US ft (NAD83) 24 HR. 35.0
TOTAL	DEPTH	151	.2 ft	SAM	PLE MI	THODS	: ASTA	1 D 15	86-08	8a; 2488-09a; 2113-08; 6032-08 HAMMER (ID): 140-Ib. Auto (MEC-05
	STARTE		/21/09			D: 9/23/				EPTH: 41.3 ft CORE BARREL TYPE: Wireline NQ3 Triple Tube, series 6 & 10 bit
DATE	SIARIE	D: 9/	21/09	COM	PLEIE	D. 9/23/	09	CASIN	IG DI	EPTH. 41.5 It CORE DARREL TIPE. Wireline Russ Tiple Tube, series 6 & 10 bit
					INI		CTD	ATA		
ELEV.	DEPTH	RUN	DRILL	REC.	JN RQD	SAMP.	REC.	RQD	L O	DESCRIPTION AND REMARKS
(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	RQD (ft) %	G	
					`					Begin Coring @ 41.3 ft
268.0	41.3	2.9	2:10/0.9	(2.7)	(2.3)	RUN 1	(12.6)	(11.3)		HARD ROCK: Light gray with brown, moderately to slightly weathered, close to
265.1	44.2		4:03 2:49	93%	79%		98%	88%		<ul> <li>moderately close fracturing, moderately hard to hard, BIOTITE QUARTZ</li> <li>GNEISS with trace magnetite (continued)</li> </ul>
		5.0	3:06 2:24	(4.9)	(4.4)	RUN 2	1			(3 joints at 30°, open with trace orange staining; 0.1 ft thick quartz vein with
			1:54	98%	88%					trace pyrite) (4 joints at 30-50°, open with trace clay; 0.4 ft thick quartz vein)
260.1	49.2		2:30 2:29							
		5.0	2:23 2:15	(5.0) 100%	(4.6) 92%	RUN 3				(4 joints at 30-50°, open with clay and orange staining)
			2:09	100%	3270					
255.1	54.2		1:12 2:56							255.1
		5.0	2:13 1:59	(5.0)	(5.0) 100%	RUN 4	(96.7) 100%	(95.8) 99%		HARD ROCK: Light gray and gray brown, slightly weathered to fresh, close to wide fracturing, moderately hard to very hard, BIOTITE QUARTZ GNEISS with
			2:10	100%	100%		10078	3376		trace magnetite
250.1	59.2		2:18 2:25							(No Joints)
		5.0	3:05 2:59	(4.9) 98%	(4.9) 98%	RUN 5				(2, 0.2 ft thick quartz veins)
			3:22 3:50	0070	0070					
245.1	64.2		4:30							<u>-</u>
		5.0	4:28 4:52	(5.0)	(5.0) 100%	RUN 6				<ul> <li>(1 joint at 45°, open with trace orange staining; 0.2 ft thick quartz vein at 66.0 ft;</li> <li>0.3 ft thick quartz vein at 67.0 ft)</li> </ul>
			5:45 5:48	10070	100 /0					
240.1	69.2		8:13						$\gg$	
		5.0	2:52 3:05	(5.0)	(5.0) 100%	RUN 7				(1 joint at 45°, tight with trace staining)
			3:19 2:20	10070	10070				$\gg$	
235.1	74.2		2:16		(5.0)	BUBLO				
		5.0	2:05 3:18	(5.0)	(5.0)	RUN 8			$\gg$	(No Joints)
			2:08 2:20							
230.1	79.2	5.0	3:18 3:23	(10)	(1.0)	RUN 9				(No Joints)
		5.0	4:12	(4.9) 98%	(4.9) 98%	KON 9				
			3:04 4:38							
225.1	84.2	5.0	3:08 2:04	(5.0)	(5.0)	RUN 10	-			(1 joint at 75°, open with trace staining)
		0.0	2:20 2:51	100%	100%					
			2:56							
220.1	89.2	5.0	2:50 3:00	(5.0)	(4.6)	RUN 11	1			(2 joints at 0-10°, open with orange-brown staining)
			2:12 2:57	100%						
045 4			1:55							ŧ.
215.1	94.2	5.0	1:54 2:19	(5.0)	(5.0)	RUN 12	1		$\gg$	(1 joint at 75°, tight)
			2:25 2:14	100%						
210.1	99.2		2:09 2:07							
210.1	39.2	5.0	1:50	(5.0)	(5.0)	RUN 13				(No Joints)
			2:15 2:03	100%	100%				V//	
205.1	104.2		1:59 1:49							7
200.1	104.2	5.0	1:51	(5.0)	(5.0)	RUN 14	1			(No Joints)
			1:30 1:47	100%	100%					
200.1	109.2		2:06 2:18							
<u>200.</u>	103.2	5.0	2:40	(4.9)	(4.7)	RUN 15	1			(2 joints at 0-10°, open with brown staining)
			2:49 2:40	98%	94%					t l
195.1	114.2		1:58 2:09							
		5.0	2:46 2:58	(5.0)	(5.0)	<b>RUN 16</b>	]			(3, <0.1 ft thick quartz veins)

Volume 1, Revision 0



SHEET 2 OF 2

BECHTEL PROJECT NO .: 251	61	MACTEC PR	OJECT NO .:	6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST: A	A. Mwembeshi		
SITE DESCRIPTION: North Ar	na 3 Projec	t Supplement	2		DRILLER: R. Landeros/D	. Reneau	FLUID L	EVEL (ft)	
BORING NO .: M-29		DRILL METH	OD: Mud Ro	tary/Rock Core	DRILL MACHINE: CME-5	50X (ATL)	0 HR.	NA	
GROUND ELEV .: 309.3 ft	(NAVD88)	NORTHING:	3,909,711	US ft (NAD83)	EASTING: 11,685,460	US ft (NAD83)	24 HR.	35.0	
TOTAL DEPTH: 151.2 ft	SAMPLE	METHODS: AS	STM D 1586-	08a; 2488-09a; 2	113-08; 6032-08	HAMMER (ID):	140-Ib. Auto	(MEC-05)	
DATE STARTED: 9/21/09	COMPLET	TED: 9/23/09	CASING	DEPTH: 41.3 ft	CORE BARREL TYPE: W	ireline NQ3 Triple T	ube, series 6	& 10 bits	

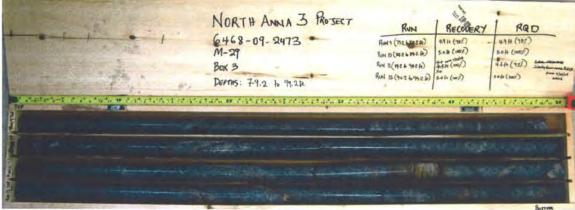
ELEV.	DEPTH		DRILL RATE	REC.	JN RQD (ft) %	SAMP.	STR REC (ft)	RQD (ft) %	LO	DESCRIPTION AND REMARKS
(ft)	(ft)	(ft)	(Min/ft)	8%	(II) %	NO,	% .	%	G	
				_		-	-			Continued from previous page
			3:57 3:55	100%	100%					HARD ROCK: Light gray and gray brown, slightly weathered to fresh, close to wide fracturing, moderately hard to very hard, BIOTITE QUARTZ GNEISS with
190.1	119.2	6.0	3:41 2:20	(5.0)	15.01	RUN 17				trace magnetite <i>(continued)</i> (0.1 ft thick guartz vein at 121.0 ft)
	1000	5.0	3:05	(5.0) 100%	(5.0) 100%	NUN II				(0,1 ft thick quartz vein at 121.0 ft)
			2:55 2:18		1.11					
185.1	124.2	5.0	2:15 2:48	(5.0)	(5.0)	RUN 18				(3 joints at 45°, tight; 0.1 ft thick quartz vein at 127.0 ft)
		0.0	1:46	100%	(5.0) 100%	1.01110				(o jointo di 40 ) agrici or i realion quante rom ar rei to ny
			2:45 3:00							
180.1	129.2	5.0	2:45	(5.0)	(5.0)	RUN 19				(No Joints)
		0.0	5:18 5:29	100%	(5.0) 100%					(in this)
			2:21							
175.1	134.2	5.0	2:24 2:37	(5.0)	(5.0)	RUN 20			222-	(No Joints)
			2:56 4:04	100%	(5.0) 100%	100 B 100 B				
			4:56	1					112	
170.1	139.2	5.0	5:38 7:32	(5.0)	(5.0)	RUN 21			-1112	(No Joints)
			12:18 4:34	100%	100%					
-			3:45							
165.1	144,2	5.0	2:20 4:02	(5.0)	(5.0)	RUN 22				(No Joints)
			3:18 3:55	100%	100%	1				
160.4	149.2		4:51 5:18				5			
160.1	1000	2.0	3,30	(2.0)	(1.7)	RUN 23	1			(2 joints at 60-75°, tight with brown staining)
158,1	151.2		4:24	100%	85%	-			158.	Boring and coring terminated at 151.2 feet.
										Boring closed by tremie method with cement-bentonite grout.
			1						F	
									-	24 hour water level measured on 9/23/2009 prior to drilling. Borehole was at a depth of 139.2 feet.
									E	
									-	
									E	
									E	
									-	
									E	
		1							E	
				1					-	
									E	
						3				
									E	
									-	
									-	
									Ē	
									-	
									-	
									E	
									-	
			_						F	
	-		-	-	-	-	1	-		

North Anna 3 Project MACTEC Project No. 6468-09-2473





M-29 - Box 2

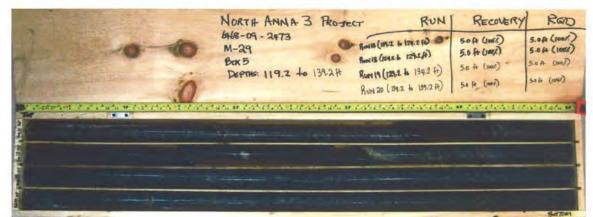








North Anna 3 Project MACTEC Project No. 6468-09-2473



M-29 - Box 5

-	NORTH ANNA 3 6468-09-2473 M-29 BOX 6 DEPTHS: 139.2 to 151.5	1114 NECOVER 7 NULL Row 22(1992 & Marzh 5.0 te (1007) 5.0 th (1007) Rum 22(1992 & Marzh 5.0 te (1007) 5.0 th (1007) Rum 23(1992 & 1512 to 2.0 th (1007) 12-th (1057) 2. ft 4
	tura en contenentet contenanta en c	and charted abort and an experience of an estate an
	1778 1-279-15-15-16 (A	Provide a state of the second
i and i and the second second	-Wanne -	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second
I The second	areas di	
and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se		

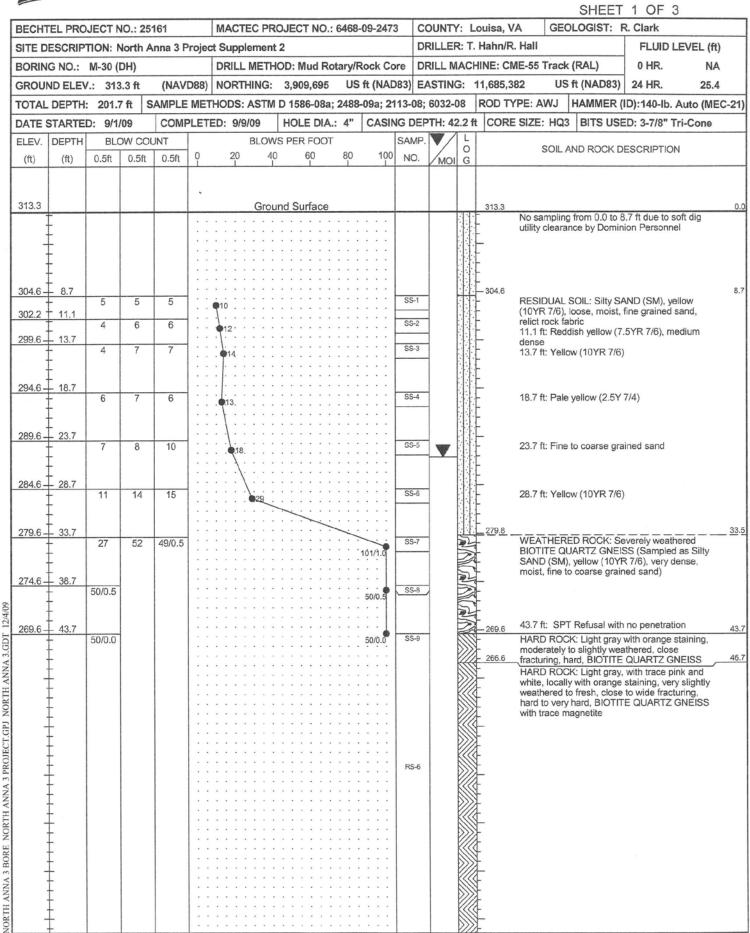
M-29 – Box 6



GEOTECHNICAL BORING LOG

Prepared By JSJ Date 12/16/09

Checked By MAL Date 21609





SHEET 2 OF 3

BECHT	TEL PRO	JECT N	10.: 2	5161		MACTEC F	R	DJECT NO .:	6468	-09-247	3 (	COUNT	Y:	: Louisa, VA GEOLOGIST: R. Clark	
					roie	ct Suppleme	ent	2			I	RILLE	R: 1	R: T. Hahn/R. Hall FLUID LEVEL (fr	t)
	IG NO.:				, 0,0			- DD: Mud Rot	an/l	Rock Co				ACHINE: CME-55 Track (RAL) 0 HR. N/	
				(114)	Dool								_		
	ND ELEV					NORTHING	_							G: 11,685,382 US ft (NAD83) 24 HR. 25.4	_
TOTAL	DEPTH:	201.7	ft	SAMPLE	ME	THODS: AST	M	D 1586-08a;	2488						EC
DATE	STARTE	D: 9/1/	09	COM	PLET	ED: 9/9/09		HOLE DIA .:	4"	CASI	IG DE	PTH: 4	2.2	2.2 ft CORE SIZE: HQ3 BITS USED: 3-7/8" Tri-Cone	
ELEV.	DEPTH	BLC	W C	OUNT		BLC	ows	S PER FOOT			SAM	P. 💙/	11	L SOIL AND ROCK DESCRIPTION	
(ft)	(ft)	0.5ft	0.5f	t 0.5ft	0	20	40	60	80	100	NO.	MO			
238.5					L	Continued	d fro	om previous	page	8					
	‡													HARD ROCK: Light gray, with trace pink and white, locally with orange staining, very slightly	
	±						÷						K	weathered to fresh, close to wide fracturing,	
	+				100								$\otimes$	hard to very hard, BIOTITE QUARTZ GNEISS with trace magnetite (continued)	
	‡												K		
	±						÷						$\otimes$		
	+						÷						K		
	Į													»»»¥	
1	±												K		
	+					 	÷						$\langle \rangle \rangle$		
	‡												K		
	±						÷						$\gg$		
	+						÷						$\otimes$		
	‡										RS-7		$\gg$		
-	±						÷						$\leq$		
	+						÷						$\mathbb{Z}$		
	‡									• • •					
	±						÷						V		
	+				3.3										
	Ŧ														
_	±														
	+						:	 							
	T								• • •						
-	±						÷								
	+				:		:	 							
	‡												K		
	‡												$\otimes$		
	+				1.								K		
	ŦΙ						×						$\otimes$		
_	‡				: :								K		
	± I				1 : :								$\gg$	>>> >>>>	
	ŦΙ						•						$\ $		
-	‡												$\langle \rangle \rangle$		
	±				1 : :								$\otimes$		
	ŦΙ												$\langle \rangle \rangle$		
_	‡				: :								$\ $		
	+				1:1										
	ŦΙ										RS-8		$\ $		
_	‡						÷								
	±				1:1		;								
	ŢΙ				· ·										
	±				1:										
	+				1:			* * * * * * *					V		
	‡														
	+				1			*****					V		
	ТІ				· · ·				× × -						





SHEET 3 OF 3

														<b>T</b>		3 OF 3	)
	EL PRO						OJECT NO .:	6468-	09-2473				ouisa, VA	_	LOGIST: F		
SITE DE	ESCRIP	TION: I	North	Anna 3	Proj	ect Supplement	12						. Hahn/R. Hall			FLUID L	EVEL (ft)
BORING	g NO.:	M-30 (	DH)			DRILL METH	IOD: Mud Rot	ary/F	Rock Co	re	ORILL M	ACH	HINE: CME-55	Track	(RAL)	0 HR.	NA
ROUN	ND ELEN	/.: 31:	3.3 ft	(NA)	VD88	B) NORTHING:	3,909,695	US	ft (NAC	983) E	EASTIN	G:	11,685,382	US	ft (NAD83)	24 HR.	25.4
OTAL	DEPTH	: 201.	7 ft	SAMPL	E ME	ETHODS: ASTM	D 1586-08a;	2488	-09a; 21	13-08	3; 6032-0	80	ROD TYPE: A	WJ	HAMMER (	D):140-lb.	Auto (MEC
ATE S	TARTE	D: 9/1	/09	CON	IPLE	TED: 9/9/09	HOLE DIA .:	4"	CASIN	IG DE	PTH: 42	2.2 fi	t CORE SIZE	: HQ3	BITS USE	D: 3-7/8" T	ri-Cone
ELEV.	DEPTH	BL	OW C	OUNT		BLOW	/S PER FOOT			SAM	P. 💙/	LO				ESCRIPTION	N.
(ft)	(ft)	0.5ft	0.5f	t 0.5ft	Ŷ	20 40	0 60	80	100	NO.	мо						
100 7					· ·	Continued f	rom previous	nade	<u>,</u>								
163.7	-			+	+-			····	, 							with trace pir	
1	-												- white	, locally hered to	with orange fresh, close	staining, very to wide fractu	y slightly uring,
+	-				1:					1			hard	to very	hard, BIOTIT	E QUARTZ (	GNEISS
1	-								::::				with		agnetite (con	anueu)	
1	-												ţ				
+	-				1:												
1	-				1:				· · ·				ł				
1	-												Ŧ				
+	-																
+					1:	********											
1	-				1:					RS-9							
+	-												F				
1	_				1								t i				
Ŧ	-				:				· · ·				1				
-	-												F				
1	-				1:								Į.				
+	_				1							111	L				
-	-												+				
1	-												Ŧ				
_	_												È.				
+	-				1								Ł				
1	-							• • •				$\otimes$	£				
1	-				1.								ŧ.				
-					1							$\gg$	1				
	Ē				1	*******							}				
- 1	-												F				
							* * * * * * *					$\leq$	\$				
-					:							$\langle \rangle \rangle$	t				
-	-									RS-1			-				
1					1.							V//	Í.				
1					+							0111	- 111.6 - Borir	ng and c	oring termina	ated at 201.7	feet.
-	_												-		d by tremie n		
-	L														onite grout.		
-																ured on 9/09.	
	-												prior			was at a dep	
-													E The	0 1001.			
-	-												L				
-	F												F				
	t l												Ę				
-	ł												L				
-	F												F				
1	t												Ę				
1	+									1			F				

Volume 1, Revision 0

DCN NAP307



SHEET 1 OF 3

										SHEET 1 OF 3
BECHT	EL PRO	JECT	NO.: 2516	51	N	IACTEC	PROJE	ECT N	0.: 6	468-09-2473 COUNTY: Louisa, VA GEOLOGIST: R. Clark
SITE D	ESCRIP	TION:	North An	na 3 Pr	roject S	Supplem	ent 2			DRILLER: T. Hahn/R. Hall FLUID LEVEL (
BORIN	g NO.:	M-30	(DH)							rry/Rock Core DRILL MACHINE: CME-55 Track (RAL) 0 HR. N
GROUN	ND ELEV	1.: 3	313.3 ft	(NAV	088) N	ORTHIN	G: 3,	909,69	95	US ft (NAD83) EASTING: 11,685,382 US ft (NAD83) 24 HR. 25
TOTAL	DEPTH	201.	.7 ft	SAM	PLE M	ETHODS	: ASTN	/I D 15	86-08	Ba; 2488-09a; 2113-08; 6032-08 HAMMER (ID): 140-Ib. Auto (MEC-2
DATES	STARTE	D: 9/	1/09	COM	PLETE	D: 9/9/0	9	CASIN	IG DI	EPTH: 42.2 ft CORE BARREL TYPE: Wireline HQ3 Triple Tube, series 6 & 10 b
ELEV.	DEPTH	RUN	DRILL	REC.	JN RQD	SAMP.	STR REC.	RQD	L	
(ft)	(ft)	(ft)	RATE (Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	O G	DESCRIPTION AND REMARKS
					•					Desia Ostas @ 42.74
269.6	43.7	3.0	N=50/0.0	(3.0)	(1.9)	RUN 1	(3.0)	(1.9)		Begin Coring @ 43.7 ft - ^{269.6} HARD ROCK: Light gray with orange staining, moderately to slightly weathered,
266.6			2:01 2:06	100%	63%		100%	63%	$\gg$	close fracturing, hard, BIOTITE QUARTZ GNEISS
200.0		5.0	3:12	(5.0)	(4.7) 94%	RUN 2	(154.2) 99%	(148.9 96%		HARD ROCK: Light gray, with trace pink and white, locally with orange staining,
			3:20 3:55	100%	94%		99%	90%		very slightly weathered to fresh, close to wide fracturing, hard to very hard, BIOTITE QUARTZ GNEISS with trace magnetite
261.6	51.7		4:19 4:47							<ul> <li>(1 joint at 0°, tight; 2 joints at 60°, tight with trace iron staining; 1 joint at 90°,</li> </ul>
		5.0	5:14 4:24	(5.0)	(4.1) 82%	RUN 3				<ul> <li>tight with iron staining)</li> <li>(2 joints at 10°, tight with trace iron staining; 1 joint at 30°, tight with trace iron</li> </ul>
			6:52 5:26						$\otimes$	staining; 1 joint at 90°, tight with iron staining)
256.6	56.7	5.0	6:57 8:22	(5.0)	(5.0)	RUN 4				(1 joint at 10°, tight with trace mica)
		5.0	8:20	100%		RS-6				
			12:33							-
251.6 250.3		1.3	15:37 6:48/0.2	(1.3)	(0.0)	RUN 5				Note: RUN 5 to RUN 9 shown together due to short run lengths. Inner core
200.0	00.0	3.7	3:09/0.1 6:24/0.5	100%	(3.3)	RUN 6 RUN 7				<ul> <li>barrel blocking off due to standard size HQ bit installed after RUN 4 completed (mistaken for HQ3 sized bit). Proper sized HQ3 core bit installed after RUN 9</li> </ul>
246.6	66.7		4:15/0.2 6:41/0.3	100%	89%	RUN 8 RUN 9				completed.
240.0	00.7	5.0	11:14/0.7 14:29 26:32	(5.0)	(4.8)	RUN 10 RUN 11	1		$\otimes$	<ul> <li>(2 joints at 10°, tight with iron staining; 1 joint at 30°, tight)</li> <li>(3 joints at 30°, tight with trace iron staining)</li> </ul>
			31:04	100%	96%	KUN TI				-
241.6	71.7		4:28						$\gg$	
		5.0	4:40 2:58	(5.0) 100%	(4.9) 98%	RUN 12				(1 joint at 0°, tight with iron staining)
			2:34 2:46						VII	-
236.6	76.7	5.0	3:11 3:48	(5.0)	(5.0)	RUN 13				(Coarse grained/pegmatitic zone from 83.4 to 83.7 ft)
		0.0	2:43 3:42	100%						
			3:45 4:58						$\otimes$	-
231.6	81.7	4.1	4:37 4:55	(4.1)	(4.1)	RUN 14				-
			6:48 10:34 12:19	100%	100%				$\gg$	-
227.5	85.8 86.7	0.9	21:09 5:58/0.1	(0.8)	(0.8)	RUN 15				-
225.2	88.1	1.4	5:25/0.9 12:50	89%	89%	RUN 16	1			- (0.1 ft thick quartz vein at 40°)
		3.6	12:50 12:34/0.4 8:05/0.6	(1.4)	(1.4)	RUN 17				(Mechanical fractures)
221.6	91.7		4:12 4:31	(3.6)	(3.6)	DI INI 40				- (Machanical fracture)
		5.0	2:21	(5.0)	(5.0)	RUN 18				- (Mechanical fractures)
			2:35 2:05	100%	100%	<b>PC</b> 7				
216.6	96.7	5.0	1:58	(5.0)	(5.0)	RS-7 RUN 19				– (Pegmatitic quartz + feldspar vein from 96.9-97.3 feet)
		0.000	2:05 2:58	100%						
211.6	101.7		2:32 2:31 2:29							
£11.0	101.7	5.0	2:29 2:10 2:25	(5.0)	(5.0)	RUN 20	1			(No Joints)
			2:31	100%	100%					
206.6	106.7		2:42 3:10		15					
		5.0	2:56 2:07	(5.0)	(5.0) 100%	RUN 21				- (No Joints)
			2:54 1:38							<b>F</b>
201.6	111.7	5.0	1:52	(5.0)	(5.0)	RUN 22	-			(1 joint at 0°, tight with trace staining; pegmatitic quartz + feldspar vein from
		5.0	2:13	(5.0)	(5.0) 100%	NUN 22				<ul> <li>I joint at 0°, tight with trace staining; pegmatitic quartz + lelospar vein from 115.0-115.3 feet)</li> </ul>
100.0			2:32							
196.6	116.7	5.0	2:09	(4.9)	(4.9)	RUN 23	1			(1 joint at 25°, tight)

Volume 1, Revision 0



SHEET 2 OF 3

BECHTEL PROJECT NO.: 25161	MACTEC PROJ	JECT NO.: 6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST: I	R. Clark	
SITE DESCRIPTION: North Anna 3 Proj	ect Supplement 2		DRILLER: T. Hahn/R. Hall		FLUID LE	EVEL (ft)
BORING NO .: M-30 (DH)	DRILL METHOD	D: Mud Rotary/Rock Core	DRILL MACHINE: CME-55	Frack (RAL)	0 HR.	NA
GROUND ELEV .: 313.3 ft (NAVD8	) NORTHING: 3	3,909,695 US ft (NAD83)	EASTING: 11,685,382	US ft (NAD83)	24 HR.	25.4
TOTAL DEPTH: 201.7 ft SAMPL	METHODS: AST	M D 1586-08a; 2488-09a; 2	113-08; 6032-08	HAMMER (ID)	MEC-21)	
DATE STARTED: 9/1/09 COMPL	ETED: 9/9/09	CASING DEPTH: 42.2 ft	CORE BARREL TYPE: Wire	eline HQ3 Triple	Tube, series 6	& 10 bits

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RQD (ft) %	L O G	DESCRIPTION AND REMARKS
					*					Continued from previous page
			2:35	98%	98%					- HARD ROCK: Light gray, with trace pink and white, locally with orange staining,
			2:28						$\gg$	very slightly weathered to fresh, close to wide fracturing, hard to very hard,
191.6	121.7	5.0	2:55	(5.0)	(4.2)	RUN 24			KKK	<ul> <li>BIOTITE QUARTZ GNEISS with trace magnetite (continued)</li> <li>(3 joints at 30°, tight to open with iron staining, moderately weathered zone from</li> </ul>
		5.0	3:04	100%	(4.2) 84%	RUN 24			6)))	<ul> <li>(3 joints at 30 , tight to open with non stanning, moderately weathered 20he nom</li> <li>123.7-124.9 ft)</li> </ul>
			1:19	10070	0470					-
100.0	100 7		2:27							-
186.6	126.7	5.0	1:54	(5.0)	(5.0)	RUN 25			$\gg$	- (No Joints)
		5.0	2:38	100%	100%	1101120			KK	- (10 301123)
			2:26						6)))	-
101 0	404 7		2:38 2:45						///	
181.6	131.7	5.0	2:38	(5.0)	(5.0)	RUN 26				- (Mechanical Fractures)
		0.0	2:49	100%	100%				$\gg$	
			3:13 3:13						KK	-
176.6	136.7		3:13			RS-8			6)))	
170.0	150.7	5.0	3:06	(5.0)	(5.0)	<b>RUN 27</b>			///	- (1 joint at 45°, tight with trace iron staining; 1 joint at 60°, tight)
			3:22	100%					011	
			3:46 4:37						2))	
171.6	141.7		5:01						K	
	191.7	5.0	7:27	(4.9)	(4.9)	RUN 28	1		699)	<ul> <li>(1 joint at 75°, tight with trace iron staining)</li> </ul>
			8:37	98%	98%				///	_
			1:46 2:33							
166.6	146.7		1:42						$\gg$	-
		5.0	2:22	(5.0)	(5.0)	RUN 29	1		KK	- (1 joint at 45°, tight)
			2:43 2:45	100%	100%				6)))	-
			2:45						///	
161.6	151.7		2:32						6111	-
		5.0	3:18	(5.0)	(4.5)	RUN 30			$\gg$	<ul> <li>(2 joints at 80-90°, tight)</li> </ul>
			3:12 4:10	100%	90%				KK	_
			5:25						$\otimes$	-
156.6	156.7		4:41						V//	-
		4.0	2:26 2:38	(4.0)	(3.2)	RUN 31				<ul> <li>(1 joint at 10°, tight with trace iron staining; 1 joint at 45°, tight)</li> </ul>
			3:43	100%	80%				V))	-
152.6	160.7		5:30						KK	-
151.6	161.7	1.0	4:08	(0.6)	(0.6)	RUN 32			$\otimes$	- (No Joints)
		5.0	2:57 3:29	60%	60%	RUN 33				- (1 joint at 35°, tight)
			3:07	(4.9) 98%	(4.9) 98%					-
	100-		3:29	30 %	5070				1//	-
146.6	166.7	5.0	1:58 2:48	(5.0)	(4.9)	RUN 34			K	- (3 joints at 50°, tight)
		0.0	3:18	100%	98%	RS-9				(o jointo de oo , digite)
			3:05	1						-
1/14 0	174 7		2:59 3:28						111	
141.6	171.7	5.0	2:56	(5.0)	(5.0)	RUN 35	1		1//	(No joints; foliation at 45°)
			3:22		100%				1	
			3:43 4:25							-
136.6	176.7		4:25							
100.0	110.1	5.0	7:22	(5.0)	(5.0)	RUN 36	1		111	- (No Joints)
			5:59	100%	100%				11	
			6:29 8:07						1	
131.6	181.7		3:21						$\gg$	
		5.0	3:08	(5.0)	(5.0)	RUN 37	1			<ul> <li>(1 joint at 45°, tight with iron staining)</li> </ul>
			2:59	100%					111	-
			3:20 3:34						11	
126.6	186.7		3:45						1	-
		5.0	4:01	(5.0)	(5.0)	RUN 38			$\gg$	<ul> <li>(1 joint at 45°, tight with trace iron staining)</li> </ul>
			4:22 4:33	100%	100%					-
			4:46						111	
121.6	191.7		5:21						1//	-
		5.0	4:49	(5.0)	(5.0)	RUN 39			K	- (No Joints)

Volume 1, Revision 0

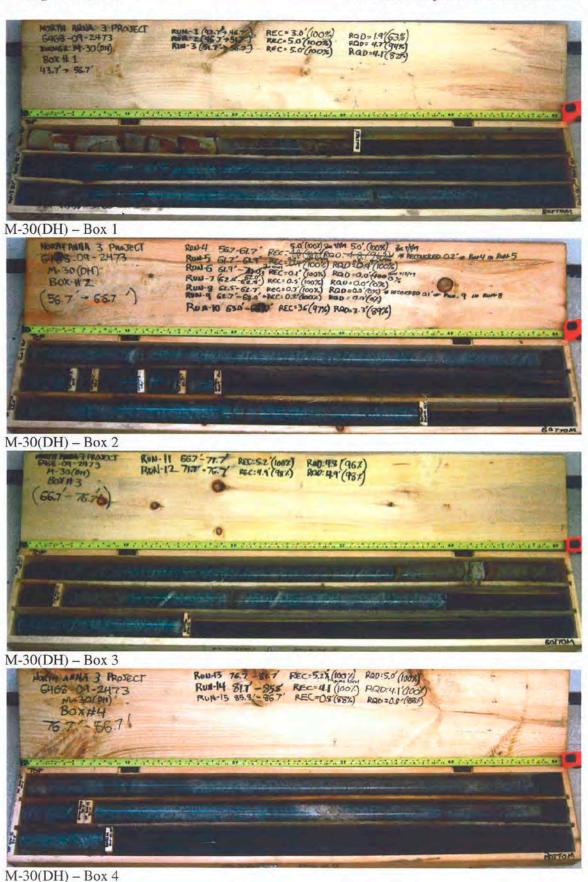


SHEET 3 OF 3

BECHTEL PROJECT NO.: 25161	MACTEC PRO	JECT NO.: 6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST:	R. Clark	
SITE DESCRIPTION: North Anna 3	roject Supplement 2		DRILLER: T. Hahn/R. Hall		FLUID LE	EVEL (ft)
BORING NO .: M-30 (DH)	DRILL METHO	D: Mud Rotary/Rock Core	DRILL MACHINE: CME-55	Frack (RAL)	0 HR.	NA
GROUND ELEV .: 313.3 ft (NAV	D88) NORTHING:	3,909,695 US ft (NAD83)	EASTING: 11,685,382	US ft (NAD83)	24 HR.	25.4
TOTAL DEPTH: 201.7 ft SAM	IPLE METHODS: AST	TM D 1586-08a; 2488-09a; 2	113-08; 6032-08	HAMMER (ID):	140-lb. Auto (	MEC-21)
DATE STARTED: 9/1/09 COI	IPLETED: 9/9/09	CASING DEPTH: 42.2 ft	CORE BARREL TYPE: Wire	Tube, series 6	& 10 bits	

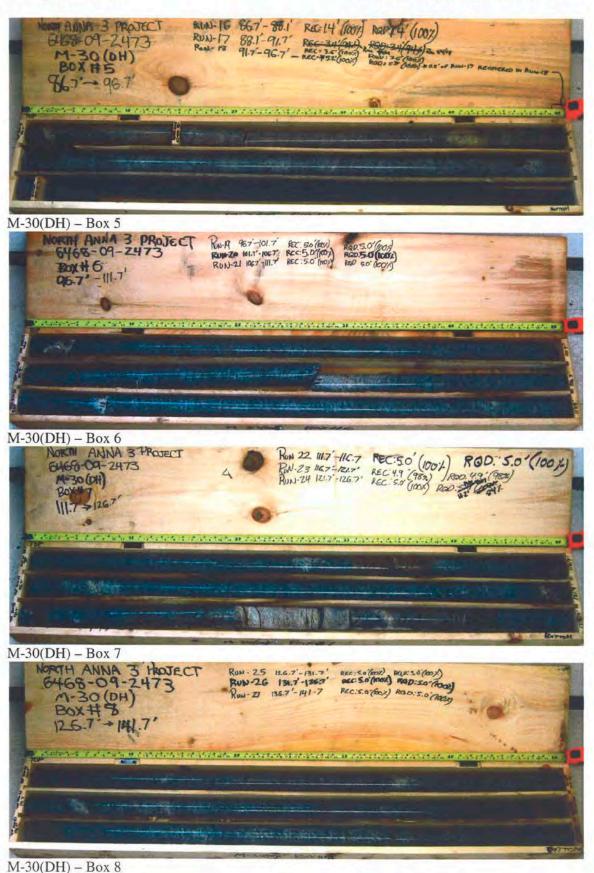
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	JN RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RQD (ft) %	LOG	DESCRIPTION AND REMARKS
			4:52 3:05		100%					Continued from previous page HARD ROCK: Light gray, with trace pink and white, locally with orange staining,
116.6	196.7	5.0	3:08 3:28 3:35 2:28	(5.0) 100%	(5.0) 100%	RUN 40 RS-10				HARD ROCK: Light gray, with trace pink and white, locally with orange staining, very slightly weathered to fresh, close to wide fracturing, hard to very hard, BIOTITE QUARTZ GNEISS with trace magnetite <i>(continued)</i> (No Joints)
111.6	201.7	-	2:36 3:42 3:25							- 111.6
										Boring closed by tremie method with cement-bentonite grout.
	5									24 hour water level measured on 9/09/2009 prior to drilling. Borehole was at a depth of 171.5 feet.

## North Anna 3 Project MACTEC Project No. 6468-09-2473



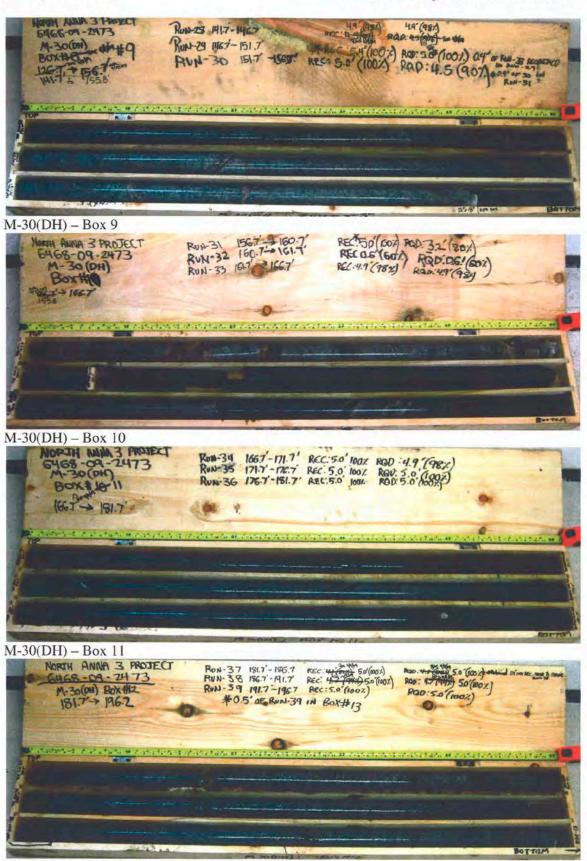
DCN NAP307

North Anna 3 Project MACTEC Project No. 6468-09-2473



DCN NAP307

North Anna 3 Project MACTEC Project No. 6468-09-2473



M-30(DH) - Box 12

North Anna 3 Project MACTEC Project No. 6468-09-2473



M-30(DH) - Box 13

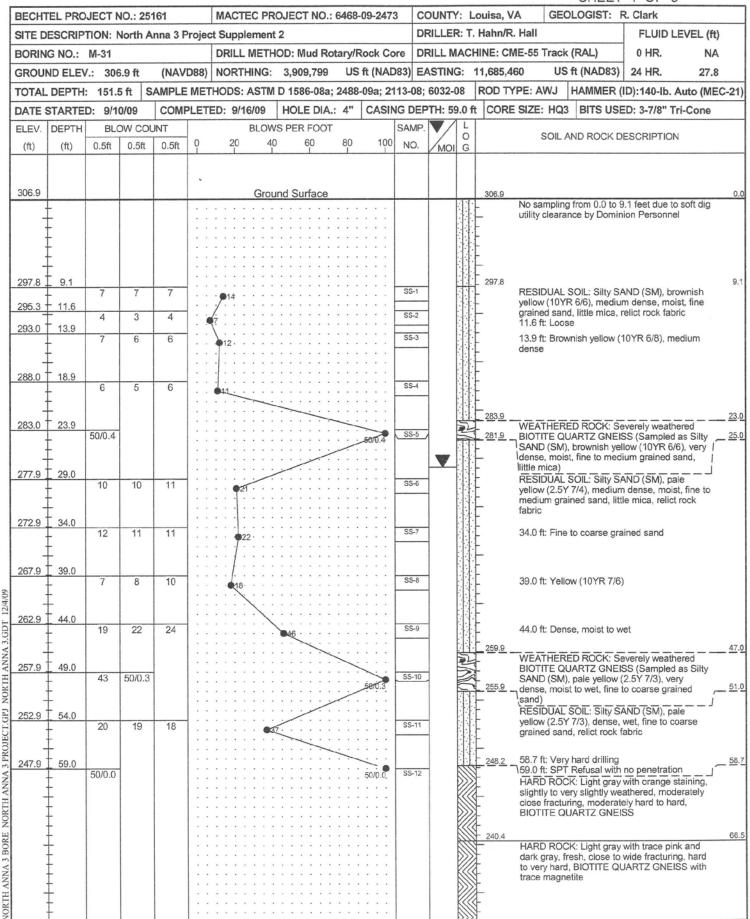


GEOTECHNICAL BORING LOG

Prepared By JSJ Date 12/16/09

Checked By MPL Date 12/16/09

# SHEET 1 OF 3





		LECT	10 . 0	5464		MACTEC DE	OIECT	0.04	20.00	2470			V. I		GEO	LOGIST: F	2 OF 3	/
	TEL PRO					MACTEC PF		0.: 646	08-09	-24/3				Louisa, VA	GEC	LUGISI: H		
			North	Anna 3 F	roje	ct Supplemen					_			. Hahn/R. Hall		10.411		EVEL (ft)
	IG NO.:					DRILL METH							-	HINE: CME-55			0 HR.	NA
ROU	ND ELE	V.: 300	6.9 ft	(NAV	/D88)	NORTHING:	3,909,7	'99 L	JS ft	(NAD	33) E	ASTING	G:	11,685,460		ft (NAD83)	24 HR.	27.8
OTAL	DEPTH	: 151.	5 ft	SAMPLE	ME	THODS: ASTN	I D 1586-	08a; 248	88-09	9a; 21	13-08	; 6032-0	80	ROD TYPE: A	WJ	HAMMER (	D):140-lb.	Auto (MEC
DATE	STARTE	D: 9/1	0/09	COM	PLET	FED: 9/16/09	HOLE	DIA.: 4	" 0	ASIN	G DE	PTH: 59	9.0 f	t CORE SIZE:	HQ3	BITS USE	D: 3-7/8" T	ri-Cone
ELEV.	DEPTH	BL	ow co	DUNT	1	BLOV	VS PER F	TOC		:	SAMP	. V/	LO		2011			
(ft)	(ft)	0.5ft	0.5ft	0.5ft	10	20 4	0 60	80	D	100	NO.	MOI			SOIL #	ND ROCK D	ESCRIPTION	N
232.1	+					Continued	from prev	ious pa	ge	+				HAR	ROC	K: Light gray	with trace pin	k and
	±				1:				: :				$\gg$	dark g	gray, fr	esh, close to	wide fracturin	ig, hard
	ŧ												$\mathbb{K}$	to ven	y hard maone	BIOTITE QU tite (continue	ARTZ GNER d)	SS with
	Į.												$\gg$	7			-,	
	t				1.1					2.2			$\mathbb{K}$	<u>t</u>				
	Ŧ												$\gg$	}				
	t				1:1			 						\$				
	+									· ·				}				
	Ŧ							 					$\otimes$	F				
	t				1									1				
	Ŧ													\$				
-	ŧ													F				
	t				1 : -					11				ŧ				
	Ŧ												$\gg$	Ŧ				
-	t							· · · ·		::				t i				
	+												$\gg$	}				
	‡									::			***	€ l				
-	t												$\gg$	1				
	Ŧ									- x				\$				
	‡									11			))))	ž –				
-	+				· ·									ŧ				
	Ŧ												$\gg$	Į.				
	t				1:					::			***	ŧ				
	+												$\gg$	}				
	‡				1					::				Ŧ				
	t													2				
	Ŧ												$\leq$	-				
	t				1			· · · ·		::				1				
	+												$\leq$	ł				
	Ŧ					 				::			$\gg$	1				
	t								• •	•••			$\leq$	£				
	Ŧ												))/	2				
	1									::				£				
	+												)))	1				
	Ŧ									11				£				
	±								• •	: :				之				
	÷				1.									\$				
	‡				1					::			)))	4				
	+													£				
	Ŧ				1					::			$\gg$	F				
	t				1					::				\$				
	+				11								$\langle \rangle \rangle$	1				
	Ţ				1					::				ŧ				
	+												$\gg$	7				
	Ţ				1					11				₹.				
	t				1								$\langle \rangle \rangle$					
	1	1												8-				

# GEOTECHNICAL BORING LOG



BECHT	TEL PRO	JECT	NO .: 24	5161		MACTEC PR	OJECT NO .	6468	-09-2473	CC	UNTY	: Lou	uisa, VA	GEO	LOGIST: F	3 OF 3 Clark	
					roioc	t Supplement		2100	JU ATTU	-			ahn/R. Hall				EVEL (ft)
-	G NO .:	2	- Or un /	ania J P	. ojec		OD: Mud Ro	tan	Rock Core	-			NE: CME-55	Track	(RAL)	0 HR.	NA
	ND ELE		0.4	/MAN/	1001	NORTHING:		_	ft (NAD8:	-					ft (NAD83)	24 HR.	27.8
				-				_		-		-	OD TYPE: A				
	DEPTH			1		HODS: ASTM	1								HAMMER (I		
	STARTE	1		-	LEI	ED: 9/16/09	HOLE DIA.	-	1		TH: 59	L	CORE SIZE:	HQ3	BITS USE	D: 3-7/8" Ti	ri-Cone
ELEV. (ft)	DEPTH (ft)	0.5ft	OW CC	0.5ft	0	20 4	/S PER FOOT	80	144	NO.	MOI	0	5	SOIL A	ND ROCK DI	ESCRIPTION	ı
(11)	(ic)	0.010	0.011	u.on		1 1					MOI	6					
157.3			-			Continued f	rom previous	page		_	-						_
-	-		_		1 -							111-	155.4 Raning	anda	oring termina	tod at 1E1 E f	inat
	-											E					eel.
3	F											+			d by tremie m onite grout.	ethod with	
-	F											F	24 hou	ur wate	r level measu	ured on 9/16/2	2009
1	Ŧ.											F		o drillin	g. Borehole		
1	t.											F	141.5	COL			
1	E .											-					
	t									1		E					
-	-											E					
-	-											+					
-	-											-					
-	F		1									F					
1	-											E					
1	-											1					
-	-											E					
-	F											F					
-	F											F					
-	F											F					
1	1										1 8	F					
1	-		8									E					
1	t											E					
-	F											F					
4	Ē.											F					
	‡		8									Ē					
3	t		ĥ.									E					
-	E.											-					
-	ł											-					
-	F											F					
-	ţ.											F					
1	ţ.											Ę					
	t											E					
	ł											F					
	Ŧ											F					
-	Į.											-					
	t.											E					
	÷											-					
-												F	0				
1	ţ											Ē					
	t											E					
9	F											F					
	Ť			-						-		E					



BECHT	EL PRO	JECT	NO.: 2516	51	IV	ACTEC	PROJE	CT N	0.: 64	68-09-2473 COU	JNTY: Louisa, VA	GEOLOGIST: R	. Clark						
SITE D	ESCRIP	TION:	North An	na 3 Pr	oject S	Supplem	ent 2			DRIL	LLER: T. Hahn/R. Hall		FLUID LE	VEL (ft)					
BORIN	G NO.:	M-31			D	RILL ME	THOD	Mud	Rota	y/Rock Core DRIL	L MACHINE: CME-55 T	rack (RAL)	0 HR.	NA					
GROUI	ND ELEV	3	306.9 ft	(NAV		ORTHIN				US ft (NAD83) EAS		US ft (NAD83)	24 HR.	27.8					
	DEPTH				1					a; 2488-09a; 2113-0		HAMMER (ID):							
						D: 9/16/					RE BARREL TYPE: Wire								
DATES	STARTE	D: 9/	10/09	COM	PLETE	D: 9/16/	09	CASIN	IG DE	PTH: 59.0 11 COR	CE DARREL ITPE: WIR	ine not inple i	ube, series 6 c	x TU DIL					
				RL	INI		STR	ΔΤΔ	1.										
ELEV.	DEPTH	RUN	DRILL RATE	REC.	RQD	SAMP. NO.	REC.	RQD	L O		DESCRIPTION A	ND REMARKS							
(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	G										
					•						Begin Coring	g @ 59.0 ft							
247.9	59.0	2.5	N=50/0.0 3:01	(2.5)	(1.3)	RUN 1	(7.5)	(6.3)		HARD ROCK	K: Light gray with orange standard or an an an an an an an an an an an an an	aining, slightly to ve	ry slightly						
245.4	61.5	5.0	3:21	100%	52% (5.0)	RUN 2	100%	84%		QUARTZ GN		nard, BIOTTE							
		5.0	3:02 3:05	100%	100%	NON 2				(3 joints at 10 (2 joints at 0°	tight)								
			4:09 2:23								, ught to open with non-sta	ining, i joint at 40 ,	ugitt)						
240.4	66.5	2.3	2:54	(2.3)	(2.3)	RUN 3	(84.6)	(83.0)		240.4 HARD ROCK	K: Light gray with trace pink	and dark gray, fres	h, close to wide						
238.1	68.8		8:32 4:21/0.3	100%	100%	RUN 4	100%			fracturing, ha (No Joints)	ard to very hard, BIOTITE Q	UARTZ GNEISS w	ith trace magnetit	te					
005 4	74.5	2.7	3:08/0.7 3:35	(2.7)	(2.7) 100%	RUN 4				(No Joints)									
235.4	71.5	5.0	3:42	(5.0)	(5.0)	RUN 5				(1 joint at 15°, tight with trace iron staining)									
			3:21 3:33 3:28	100%	100%														
230.4	76.5		3:33 2:45																
200.4	10.0	3.0	3:38 4:14	(3.0)	(3.0)	RUN 6				(No Joints)									
227.4	79.5		5:05	100%															
225.4	81.5	2.0	3:58 4:54	(1.7) 85%	(1.7) 85%	RUN 7					0°, tight top open with iron s								
		5.0	4:45 5:15	(5.0)	(3.7)	RUN 8				(2 joints at 0°	°, tight with iron staining; 2 j	oints at 90°, tight)							
			4:15 3:05	100%	74%														
220.4	86.5		4:01	(5.0)	(4.7)	DUNIO				(4 1-1-1-00)	a tight disint of 450 second		inint at 75° anon						
		5.0	4:17 3:33	(5.0)	(4.7) 94%	RUN 9				with iron stail	°, tight; 1 joint at 45°, open ning)	with iron staining; 1	joint at 75°, open	1					
			3:33 3:41																
215.4	91.5	5.0	4:05 6:12	(5.0)	(5.0)	RUN 10	-			(1 joint at 0°,	open)								
		0.0	6:51 3:05	100%						(,,),,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,									
			3:11																
210.4	96.5	5.0	3:18 2:45	(5.0)	(5.0)	RUN 11				- (1 joint at 90	°, tight)								
			3:04 2:55	100%	100%														
205.4	101.5		3:59 4:01																
200.4	101.0	5.0	3:04 3:55	(5.0)	(5.0)	RUN 12	1			(No Joints)									
			3:56	100%	100%														
200.4	106.5		4:27 4:55																
		5.0	5:46 7:12	(5.0)	(5.0) 100%	RUN 13				(Pegmatitic o	quartz + feldspar vein at 10	8.5 ft)							
			3:52 3:12																
195.4	111.5		3:24	(E A)	(E.0)	RUN 14	-			(No lointe)									
		5.0	2:29 2:33	(5.0)	(5.0) 100%	KUN 14				- (No Joints)									
			2:45 3:01																
190.4	116.5	5.0	3:08 3:05	(5.0)	(5.0)	RUN 15	-			- (3 joints at 0	°, tight with iron staining an	d slight weathering)							
			3:33 4:04	100%	100%					(-)									
105 1	404 5		4:18																
185.4	121.5	5.0	4:22 4:18	(5.0)	(5.0)	RUN 16	1				°, tight; 1 joint at 20°, tight;		ght with iron stair	ning;					
			4:22 2:35	100%	100%					pegmatitic q	uartz + feldspar vein at 30°	at end of run)							
180.4	126.5		2:28 2:01																
100.4	120.0	5.0	2:58	(5.0)	(5.0)	RUN 17	1			(No Joints)									
			2:02	100%	100%														
175.4	131.5		2:33 2:55																
		5.0	2:25 2:33	(5.0) 100%	(5.0) 100%	RUN 18				(No Joints)									

Volume 1, Revision 0

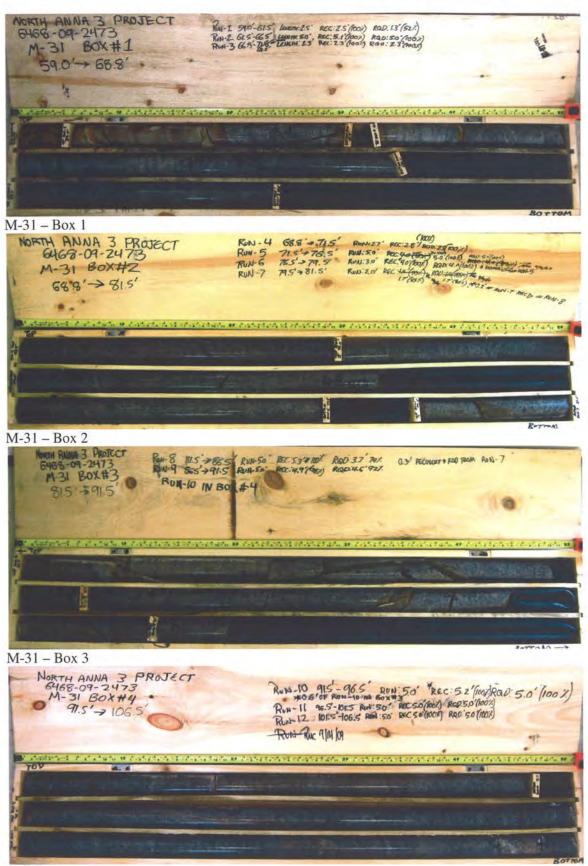


SHEET 2 OF 2

BECHTEL PROJECT NO .: 251	61	MACTEC PRO	DJECT NO .:	6468-09-2473	COUNTY:	Louisa, VA	GEOLOGIST: F	R. Clark	
SITE DESCRIPTION: North Ar	nna 3 Projec	t Supplement	2		DRILLER:	T. Hahn/R. Hall		FLUID L	EVEL (ft)
BORING NO .: M-31		DRILL METH	OD: Mud Rot	tary/Rock Core	DRILL MAG	CHINE: CME-55	Track (RAL)	0 HR.	NA
GROUND ELEV .: 306.9 ft	(NAVD88)	NORTHING:	3,909,799	US ft (NAD83)	EASTING:	11,685,460	US ft (NAD83)	24 HR.	27.8
TOTAL DEPTH: 151.5 ft	SAMPLE	METHODS: AS	STM D 1586-	08a; 2488-09a; 2	113-08; 603;	2-08	HAMMER (ID):	140-lb. Auto	(MEC-21)
DATE STARTED: 9/10/09	COMPLE	TED: 9/16/09	CASING	DEPTH: 59.0 ft	CORE BAR	REL TYPE: Wi	reline HQ3 Triple	lube, series 6	& 10 bits

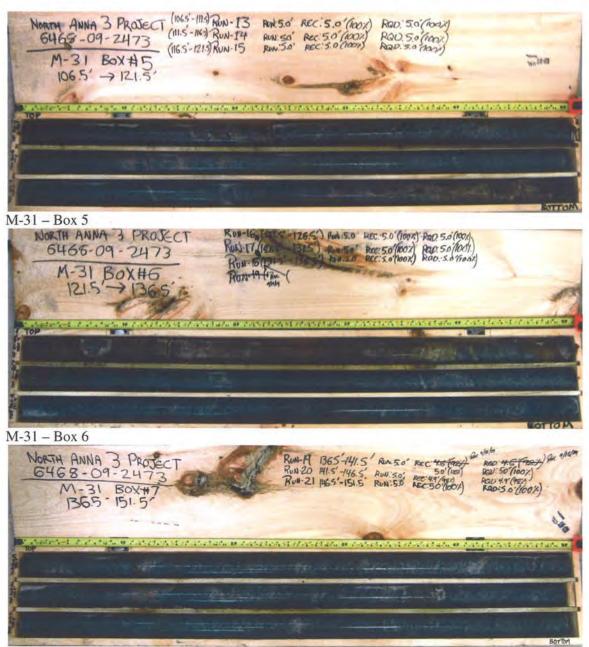
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft)	RQD (ft) %	SAMP. NO,	STR REC. (ft) %	RQD (ft) %	LOG	5	DESCRIPTION AND REMARKS	
1.1					*				5		Continued from previous page	
	1.000		3:05 3:30 3:36							*	HARD ROCK: Light gray with trace pink and dark gray, fresh, close to wide fracturing, hard to very hard, BIOTITE QUARTZ GNEISS with trace magnetite	
170,4	136.5	5.0	4:57	(5.0)	(5.0)	RUN 19			K	-	(continued) (Pegmatitic quartz + feldspar + calcite vein at 137.0 feet)	
			2:28 2:45	100%	100%				$\otimes$	X	() ogninging dan at terster, entere ter at ter terd	
165,4	141.5	_	2:41 2:33							\$	and the second second second second second second second second second second second second second second second	
		5.0	2:30 2:34	(4.9) 98%	(4.9) 98%	RUN 20		1.1		F	(Quartz vein with pyrite at 45° at top of run)	
100			3:02 3:09							×		
160.4	146.5	5.0	3:40 2:34	(5.0)	(5.0)	RUN 21			K		(No Joints)	
			2:44 2:50	100%	100%					*		
155.4	151.5		3:24 3:42			_	_		K	155.4		151
100.4	101.0								T	-	Boring and coring terminated at 151.5 feet.	
										C	Boring closed by tremie method with cement-bentonite grout.	
										E	24 hour water level measured on 9/16/2009 prior to drilling. Borehole was at a depth of 141.5 feet.	
										E	and a state	
1.0										F		
										F		
										F		
									1	E		
										E		
										-		
- 1								0		F		
										F		
										F		
									1	E		
										1		
										Ł		
										-		
										F		
							1 1			F		
										E		
										1		
										-		
				1						-		
										F		
										F		
										-		
										-		
										-		
										F		
										E		
										÷		

North Anna 3 Project MACTEC Project No. 6468-09-2473



M-31 - Box 4

North Anna 3 Project MACTEC Project No. 6468-09-2473



M-31 – Box 7



GEOTECHNICAL BORING LOG Prepared By JSJ Date 12/16/09

Checked By Mg Date 12/16/09

BECHT	EL PRO	JECT N	0.: 25	161	M	ACTEC PRO	JECT NO .:	6468-	09-2473	C	OUNT	Y: L	ouisa, VA GEOLOGIST: I	R. Clark	
SITE DE	SCRIP	TION: N	lorth A	nna 3 F	Project S	upplement 2	2			D	RILLE	R: F.	Cox/R. Hall	FLUID LEV	/EL (ft)
ORING	G NO .:	M-32			DF	RILL METHO	D: Mud Ro	tary/F	Rock Co	e D	RILL N	ACH	INE: CME-55 Track (RAL)	0 HR.	25.5
GROUN	DELE	/.: 313	.2 ft	(NAV	D88) NO	ORTHING:	3,909,876	US	ft (NAD	83) E	ASTIN	G: '	11,685,527 US ft (NAD83)	24 HR.	32.5
OTAL	DEPTH	: 62.2	ft S	AMPLE	METHO	DS: ASTM D	0 1586-08a;	2488	-09a; 21	13-08;	6032-	80	ROD TYPE: AWJ HAMMER (	ID):140-lb. Au	to (MEC-2
DATE S	TARTE	D: 9/28	3/09	COM	PLETED:	9/28/09	HOLE DIA.	: 4"	CASIN	G DEF	TH: 9	.6 ft	CORE SIZE: NQ3 BITS USE	D: 3-7/8" Tri-	Cone
ELEV.	DEPTH	BLC	W COL	JNT		BLOWS	PER FOOT			SAMP.	1	L	SOIL AND BOOK D	ECODIDITION	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20 40	60	80	100	NO.	MO	1.50	SOIL AND ROCK D	ESCRIPTION	
											-				
313.2					*	Crown	d Surface						242.0		
010.2	-		-			Groun	iu Sunace		1	-		tim	313.2 No sampling from 0.0 to 9		
1								1.1	1 0 = 1 0 =				utility clearance by Domin	ion Personnel	
1								***	A. R. R. 4 - A. A.				-		
+	3								1				-		
303.6	96				0.63.8	*****		* * *					- 303.6		
	-	3	3	3					1	SS-1	1	III	<ul> <li>RESIDUAL SOIL: Sandy</li> <li>yellow (5YR 6/6), medium</li> </ul>	SILT (ML), reddi	ish
301.2	12.0	2	2	3	5.			:::		SS-2			grained sand, some mica	, relict rock fabri	c
298.8	14,4	2	2	4	T					SS-3	-		14.4 ft: Yellowish red (5YI	R 5/8)	
7		-	-		- 16			3 + 4		-					
294.6	- 18.6		-	3						SS-4					
+		1	2	3	•5					20-4	-		-		
+	-												-		
289.5 -	- 23.7	1	2	2					1 0 1	SS-5			- 23.7 ft: Yellow red (5YR 5	i/6), soft, few min	ca
#	2								1.1						
284.6	- 28.6		-					1.1				Ш			2
+	-	2	2	4	<b>\$</b> 6					SS-6			<ul> <li>RESIDUAL SOIL: Silty S/ red (5YR 5/6), loose, moil</li> </ul>	st, fine grained s	wish sand,
+								111			V		some mica, relict rock fab	ric	
279.6	- 33.6	2	2	3	-				244	SS-7			- 33.6 ft: Wet, few mica		
1		-							1		1				
274.6	- 38.6								222						
1	2	2	4	6				114		SS-8			<ul> <li>38.6 ft: Yellowish brown ( dark gray (10YR 3/1) stre</li> </ul>	10YR 5/4) with v aks. moist to we	very et,
1								1.4.4	1.1				some mica		
269.6	- 43.6	3	6	8				***		SS-9			- 43.6 ft: Olive gray (5Y 5/2	), medium dens	e, wel
1						He				-					
264.6	- 48.6												264.6		4
1	-	11	28	50/0.3					50/0.3	SS-10		2	<ul> <li>WEATHERED ROCK: Se BIOTITE QUARTZ GNEI</li> </ul>	everely weather	ed
1	5							* * *				R	<ul> <li>SAND (SM), olive gray (5</li> <li>5/3), very dense, wet, fine</li> </ul>	Y 5/2) to olive (5	5Y
259.6	- 53.6	50/0.3			1111	11115				SS-11		R	sand, some mica, few qu		ineo.
		00,0.0			1			* * *	50/0.3		1	G	-		
256.0	57.2	50/0.0						* * *	50/0.0	SS-12	1		256.0 57.2 ft: SPT Refusal with HARD ROCK: Light gray.		red to
+	-				1 2 1 1			- 3-3	£ 1 1 = 1 m				<ul> <li>fresh, moderately close fr</li> <li>BIOTITE QUARTZ GNEI</li> </ul>	acturing, very ha	ard.
-												M	251.0	2	e
-													Boring and coring termina	ated at 62.2 feet	4
-	2												Boring closed by tremie n cement-bentonite grout.	nethod with	
-															
-	-												-		
-															
1		1											<u> </u>		



SHEET 1 OF 1

BECHTEL PROJECT NO .: 251	61	MACTEC PRO	OJECT NO .:	6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST: R	. Clark	
SITE DESCRIPTION: North Ar	nna 3 Projec	t Supplement	2		DRILLER: F. Cox/R. Hall		FLUID L	EVEL (ft)
BORING NO .: M-32		DRILL METHO	OD: Mud Rot	ary/Rock Core	DRILL MACHINE: CME-5	5 Track (RAL)	0 HR.	25.5
GROUND ELEV .: 313.2 ft	(NAVD88)	NORTHING:	3,909,876	US ft (NAD83)	EASTING: 11,685,527	US ft (NAD83)	24 HR.	32.5
TOTAL DEPTH: 62.2 ft	SAMPLE	METHODS: AS	STM D 1586-0	08a; 2488-09a; 2	113-08; 6032-08	HAMMER (ID):	140-lb. Auto	(MEC-21)
DATE STARTED: 9/28/09	COMPLET	TED: 9/28/09	CASING D	DEPTH: 9.6 ft	CORE BARREL TYPE: W	ireline NQ3 Triple T	ube, series 6	bit

		DRILL	I RI	JN	Ar 63 Art.	SIR	AIA	1 1 1	
ELEV. (ft)	DEPTH RUN (ft) (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	LOG	DESCRIPTION AND REMARKS
				•	-				Begin Coring @ 57.2 ft
256.0	57.2 5.0	N=50/0.0 1:20 2:50 3:11 2:36 2:45	(3.9) 78%	(3.7) 74%	RUN 1	(3.9) 78%	(3.7) 74%		<ul> <li>HARD ROCK; Light gray, slightly weathered to fresh, moderately close fracturing, very hard, BIOTITE QUARTZ GNEISS (4 joints at 10°, tight with iron staining)</li> <li>251.0</li> </ul>
251.0	62.2	3:45	-			1		2222	Boring and coring terminated at 62.2 feet.
									Boring closed by tremie method with cement-bentonite grout.

North Anna 3 Project MACTEC Project No. 6468-09-2473



M-32 – Box 1



GEOTECHNICAL BORING LOG

Prepared By JJJ Date 12/16/09

Checked By MAL Date 12/16/09

BECHT	EL PRC	<b>JECT</b>	NO.: 25	161	-	MACTEC PR	OJECT NO .:	6468-	09-2473	0	COUNTY	/: L	ouisa, VA GEOLOGIST: K. L	loyd
SITE D	ESCRIP	TION:	North A	nna 3 P	Projec	t Supplement	2			C	RILLEF	R: D.	. White/O. Smith	FLUID LEVEL (ft)
BORIN	G NO.:	M-33				DRILL METH	OD: Mud Ro	tary		E	RILL M	ACH	HINE: CME-55LC Track (RAL)	HR. ND
GROUN	ND ELEN	V.: 30	3.8 ft	(NAV	D88)	NORTHING:	3,909,984	US	ft (NAD	83) E	ASTIN	G:	11,685,615 US ft (NAD83) 24	HR. ND
TOTAL	DEPTH	: 64.9	ft S	AMPLE	MET	HODS: ASTM	D 1586-08a;	2488	-09a; 21	13-08	; 6032-0	08	ROD TYPE: AWJ HAMMER (ID):	140-Ib. Auto (MEC-
DATE S	STARTE	D: 9/2	8/09	COMP	PLETE	ED: 9/28/09	HOLE DIA.	4"	CASIN	G DE	PTH: 8.	7 ft	CORE SIZE: NA BITS USED:	3-7/8" Tri-Cone
ELEV.	DEPTH	BL	ow cou	JNT		BLOW	S PER FOOT			SAMF	. V/	L		DIDTICU
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20 40	60	80	100	NO.	MOI	0 G	SOIL AND ROCK DESC	RIPTION
			1										2.0	
303.8	1	-	-				ind Surface	-		-	-	m	- No sampling from 0.0 to 9.1 fe	eet due to soft dig
1	-				4.00				1.2.4				- utility clearance by Dominion	
-	1					*******			110				-	
-					11		******						-	
-					1 2 2								-	
294.7	- 9.1	2	3	3	1.5					SS-1	-	₩₩	RESIDUAL SOIL: SILT with S	and (ML).
292.3	- 11.5	-			T						-		<ul> <li>yellowish red (5YR 5/8), medi</li> <li>fine grained sand, some mica</li> </ul>	um stiff, moist,
289.7	14.1	2	2	3		5	*****			SS-2	1		black staining, relict rock fabr	
209.1 -	- 14.1	2	3	3	1	8 8	*****	* * *		SS-3			-	
1	2	1.1				*******	******	* * *				MI	-	
284.6	- 19.2					* * * * * * * *	*****	* * *	1.2.8				-	
1	2	2	3	5		8			1.11	55-4			2	
-												Щ	RESIDUAL SOIL: SIIty SAND	(SM), medium
279.7	_ 24.1	3	5	6		1	******			SS-5	-		dense, moist, fine grained sar	
-	-	0	0	0	1.	•111 ··· · · · ·		1 4 4 3 4 4		000	-	Ш	RESIDUAL SOIL: SILT with S	and (ML),
	-		-		1.1	******	******	* * *	* * *				yellowish red (5YR 5/8), stiff, grained sand, some mica, reli	
274.7	- 29.1	4	5	6	13.5				1.1.1	SS-6		III	29.1 ft: Dark greenish gray (1	
1					1	1		* * *					271.8	
269.7	34.1				1 2 2								RESIDUAL SOIL: Sandy SIL greenish gray (10GY 4/1), ver	
-		5	8	10						SS-7			grained sand, some mica, reli	
-							******		* * * * * *				- 39.1 ft: Very dark greenish gr	av (5GV 5/1) and
264.7	39.1	10		10	1.2					SS-8	-		<ul> <li>dark yellowish brown (10YR 4</li> </ul>	
-	-	10	13	16		29		* * *	+ + + + + + + + + + + + + + + + + + + +	33-0	-		- grained sand	
	÷				1.4	*******						5	261.8 42.0 ft: Hard Drilling WEATHERED ROCK: Seven	ely weathered
259.7 -	44.1	28	50/0.5		1.0	*******	******		~	SS-9	-		BIOTITE GNEISS (Sampled a (SM), very dark greenish gray	
-					1.1	******	* * * * * *		50/0.5		1	2	dense, moist, fine to coarse g some mica, relict rock fabric)	rained sand,
254.7	49.1				1.5	******	*****		11				Some mica, relict fock lability	
-	E.	36	50/0.3			* * * * * * *			50/0.3	SS-10	-	2	<ul> <li>49.1 ft: Severely weathered B</li> <li>(Sampled as Sandy SILT (ML)</li> </ul>	
-	-				1. 11							R	greenish gray (5GY 3/1), hard	l, moist, fine to
249.7	54.1	41	50/0.3		1.3	******	*****			SS-11	-	2	coarse grained sand, some n fabric)	ilida, Tellot TOCK
	-	41	50/0.3						50/0.3	2011	1	K		
	-				11.14		* * * * * * *	* * *	11			R	t.	
244.7 _	- 59.1	59	41/0.1				*****	111	100/0.6	SS-12		K	59.1 ft: Severely weathered B	
1	-				1.4	*******			100/0.0			2h	(Sampled as Silty SAND (SM 2/1), very dense, moist, fine to	
239.7	64.1					******		2 8 3				B	sand, some mica, relict rock f	abric)
-	-	_44_	50/0.3			1111111	1.2.3.2.1		50/0.3	SS-13	-	72	238.9 Boring terminated at 64.9 fee	t
	-												Boring closed by tremie meth	
-	F												cement-bentonite grout.	
	F												No 24 HR fluid level because	boring grouted
5	1												<ul> <li>same day boring drilled.</li> </ul>	10000



GEOTECHNICAL BORING LOG

Prepared By TIT Date 12116105 Checked By MRL Date 121609

by offic Date tottet

BECHT	EL PRO	JECT N	IO.: 25	161	MACTEC PI	ROJECT NO.: 6468	-09-2473	COUNT	TY: 1	Louisa, VA GEOLOGIST: K	C. Lloyd
SITE DE	SCRIP	TION: N	North A	nna 3 P	roject Supplemer	t 2		DRILLE	ER: D	). White/O. Smith	FLUID LEVEL (ft)
BORING	S NO.:	M-34			DRILL MET	HOD: Mud Rotary		DRILL	MAC	HINE: CME-55LC Track (RAL)	0 HR. NA
GROUN	DELEV	1.: 280	).9 ft	(NAV	088) NORTHING	3,910,122 US	ft (NAD83)	EASTIN	VG:	11,685,736 US ft (NAD83)	24 HR. 13.0
TOTAL	DEPTH	63.0	ft S	AMPLE	METHODS: AST	1 D 1586-08a; 2488	-09a; 2113-	08; 6032	-08	ROD TYPE: AWJ HAMMER (	D):140-lb. Auto (MEC-0
DATE S	TARTE	D: 9/2	8/09	COMP	LETED: 9/29/09	HOLE DIA.: 4"	CASING	DEPTH:	8.7 ft	CORE SIZE: HQ3 BITS USE	D: 3-7/8" Tri-Cone
ELEV.	DEPTH	BLC	ow cou	JNT	BLO	VS PER FOOT	SA	MP.	LO	SOIL AND ROCK D	ESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 20 4	0 60 80	100 N	0. M			ESCRIPTION
280.9						und Surface					
200.9	-	-	-		Gro	und Sunace		-	tm	280.9 No sampling from 0.0 to 1	
1										dig utility clearance by Do	minion Personnel
1							1.0.0		111	-	
+							111				
Ŧ											
269.8	11.1									269.8	1
+		3	4	5			S. S	S-1		RESIDUAL SOIL: SILT wi	th Sand (ML), dark
267.3	13.6	2	3	4			S	5-2	111	- coarse grained sand, som	
+					7				14	RESIDUAL SOIL: Sandy :	SILT with Gravel
262.1	18.8									(ML), brownish yellow (10 stiff, moist, fine to coarse	YR 6/8), medium   grained sand, little
-02.1	10.0	7	9	11	20		S	S+3		gravel sized rock fragmen RESIDUAL SOIL: Sandy	ts, some mica
1										yellowish brown (10YR 3/	6) and black (10YR
257.1	23.8		-	10				S-4		<ul> <li>2/1, very stiff, moist, fine g mica, relict rock fabric</li> </ul>	grained sand, some
+		4	6	10	•16					E	
	-									-	
252.1	28.8	12	25	47		72	S	S-5		28.8 ft: Dark yellowish bro	wn (10YR 3/6) and
+										very dark greenish gray (1 248.9	3
247.1	33.8	1.00					V.L	_	21	WEATHERED ROCK: Se BIOTITE GNEISS (Samp	
Ŧ		27	50/0.5				50/0.5 S	S-6		(ML), very dark greenish g hard, moist, fine grained s	gray (10GY 3/1),
7	-								R	relict rock fabric)	
242.1	38.8	25	50/0.4				s	S-7	L	4	
7			221311				50/0.4		5	Ŧ	
237.0	43.9								5	237.0	4
-	-	50/0.2				* * * * * * * * * * *	. 50/0.2 S	S-8		HARD ROCK and WEAT Black, severely to modera	HERED ROCK:
7						 			Æ	weathered, close fracturin hard, BIOTITE GNEISS	ig, soft to medium
1	2					* * 1 * * * * * * * * * *	1.1.0			Haid, DIOTTE GIVEISS	
+											
1						· · · · · · · · · · · ·				227,9	5
+									5	HARD ROCK: Black, mod slightly weathered, close	to moderately close
+							* ( )			fracturing, moderately har GNEISS	d to hard, BIOTITE
+										1 Alexandre	
-										1 Alexandre	
-	-			_					11	217.9	
-										<ul> <li>Boring and coring termina</li> </ul>	
-	-									Boring closed by tremie n	nethod with
-										- cement-bentonite grout.	
1										<ul> <li>24 hour water level meas</li> <li>prior to drilling. Borehole</li> </ul>	
			1	1						- 44.0 feet.	

Volume 1, Revision 0

DCN NAP307

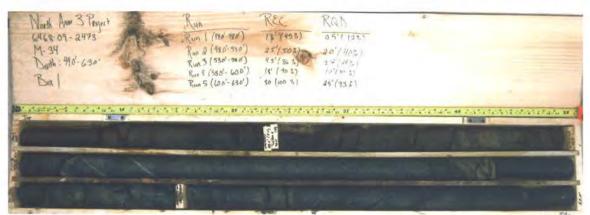


SHEET 1 OF 1

BECHTEL PROJECT NO .: 251	61	MACTEC PR	OJECT NO .:	6468-09-2473	COUNTY: Louisa, VA	GEOLOGIST: K	Lloyd	
SITE DESCRIPTION: North An	na 3 Projec	t Supplement	2		DRILLER: D. White/O. Si	mith	FLUID L	EVEL (ft)
BORING NO .: M-34		DRILL METH	OD: Mud Rol	ary	DRILL MACHINE: CME-5	5LC Track (RAL)	0 HR.	NA
GROUND ELEV .: 280.9 ft	(NAVD88)	NORTHING:	3,910,122	US ft (NAD83)	EASTING: 11,685,736	US ft (NAD83)	24 HR.	13.0
TOTAL DEPTH: 63.0 ft	SAMPLE	METHODS: AS	STM D 1586-	08a; 2488-09a; 2	113-08; 6032-08	HAMMER (ID):	140-lb. Auto	(MEC-02)
DATE STARTED: 9/28/09	COMPLET	TED: 9/29/09	CASING	DEPTH: 8.7 ft	CORE BARREL TYPE: W	/ireline HQ3 Triple T	ube, series 6	bit

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC.	RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RQD (ft)	LOG	DESCRIPTION AND REMARKS	
					•					Begin Coring @ 44.0 ft	
236.9	44.0	4.0	0:26 1:30 1:54	(1.8) 45%	(0.5) 13%	1.0) RUN 2	(4.3) 48%	(2.5) 28%		HARD ROCK and WEATHERED ROCK: Black, severely to moderately severely weathered, close fracturing, soft to medium hard, BIOTITE GNEISS (continued) (Several joints at 0-10°, open) (3 joints at 0-10°, open; 1 joint at 20°, open)	
232.9	48.0	5.0	1:46 1:42 2:15 2:12 2:14	(2.5) 50%	(2.0) 40%						
227.9	53.0	5.0	1:30 2:13 2:39 2:17 2:27	(4.3) 86%	(3.7) 74%	RUN 3	(9.1) 91%	(7.5) 75%		HARD ROCK: Black, moderately severe to slightly weathered, close to moderately close fracturing, moderately hard to hard, BIOTITE GNEISS (5 joints at 50-60°, tight to open)	141
222.9	58.0	2.0	2:06	(1.8)	(1.0)	RUN 4				(1 joint at 60°, open)	
220.9	60.0	3.0	10:41 2:04	90%	50%	RUN 5			1777	(2 joints at 0-10°, open; 1 joint at 70°, tight)	
217.9	63.0		1:58 2:15	100%	93%	_		_	217.9	Boring and coring terminated at 63.0 feet.	6
									E		
									lies less les al statut	Boring closed by tremie method with cement-bentonite grout. 24 hour water level measured on 9/29/2009 prior to drilling. Borehole was at a depth of 44.0 feet.	
									and contract construction		

North Anna 3 Project MACTEC Project No. 6468-09-2473



M-34 - Box 1