GEOTECHNICAL DATA REPORT, REV. 1

| Rev. 1

RESULTS OF GEOTECHNCIAL EXPLORATION AND TESTING
NORTH ANNA POWER STATION – COL PROJECT
LOUISA COUNTY, VIRGINIA

September 28, 2007

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Prepared By

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RALEIGH, NORTH CAROLINA

MACTEC PROJECT No. 6468-06-1472

Submitted To

VIRGINIA ELECTRIC AND POWER COMPANY

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RICHMOND, VIRGINIA

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SECTION 1
OVERVIEW

1.1 Introduction

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 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.

MACTEC executed its services in accordance with Dominion Purchase Order No. 70157983. The field work commenced on July 31, 2006 and was completed on November 28, 2006. The Scope of Work was defined in Exhibit D of MACTEC's contract with Dominion, and is briefly described below.

- Preparing and submiting a Quality Assurance Project Document and 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 Dominion.
- 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 superintendent 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 as required.
- Performing Standard Penetration Tests (SPT), obtaining samples using a split spoon sampler and performing SPT energy measurements..
- Obtaining undisturbed samples using thin walled sampler or Pitcher Barrel sampler.
- Obtaining rock cores using "H" 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.
- Excavating and backfilling test pits and obtaining bulk samples.
- Installing ground water observation wells, performing field permeability tests, and obtaining water samples.
- Performing electrical Cone Penetrometer Tests (CPT) with down-hole seismic tests and porewater dissipation tests at selected locations.
- Performing down-hole geophysical logging.
- Performing down-hole acoustic televiewer logging.
- Performing Suspension P-S logging

- Performing field resistivity testing.
- Restoring the work areas.
- Performing laboratory testing on soil and rock samples.
- Preparing a Data Report containing the data generated by the subsurface investigation and laboratory testing activities.
- Performing all work under MACTEC's approved Safety Program.

Sampling and testing related to the geotechnical exploration was designated as "Safety-Related" by Dominion. As such, the work was completed under a Quality Assurance Program meeting the Code of Federal Regulations 10 CFR 50, Appendix B and conforming to the provisions of ANSI/ASME N45.2-1977 and ASME NQA-1-1994.

This data report describes the field exploration program, testing methods, and laboratory testing program and presents the results.

1.2 Personnel

MACTEC completed field work for this project under the direction of Dominion's Site Coordinator, Mr. Raj Harnal, with assistance from NSS personnel. Technical support was provided Mr. John Davie, (Bechtel), Mr. Sammy Jabbour (Bechtel) and Mr. Garrett Day (Bechtel). Bechtel was contracted by Dominion to provide technical and general oversight support to Dominion.

Primary MACTEC personnel and their responsibilities were as follows:

Stephen J. Criscenzo	Project Manager
J. Allan Tice, P.E.	Project Principal
Michael P. Lear	Site Superintendent, Report Preparation
Shawn Lehman	Rig Geologist
Steven Nicely	Rig Geologist
Joseph Lachewitz	Rig Geologist
James Howard	Rig Geologist
Joseph Wallen	Rig Geologist, Water Sampling
Kimberly Charles Smith	Rig Geologist, Water Sampling, Slug Testing
William Grimes	Slug Testing, Report Preparation
R. Keith Pendley	Drilling Manager
Lee Brian Johnson	Laboratory Services Manager
Steven Copley	Report Preparation
Zeynep Ozkul	Packer Test Data Analysis
Dan Blair	Quality Assurance Representative
John E. Lynch,	Quality Assurance Manager

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 in separate volumes and are as follows:

Appendix	Contains
A	Survey Data and Test Locations
B	Geotechnical Borings Logs, (Soil and Rock Logs), Geotechnical Test Pit Logs, and SPT Energy Ratio Measurements
C	Observation Well Logs and Development Records, Slug and Packer Test Data, Water Chemistry Tests.
D	Cone Penetrometer Test Results
E	Geophysical Test Data
F	Laboratory Testing Data (Geotechnical)

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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 Subpart 2.2 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 Virginia Beach, Virginia. The initial phase was to stake preliminary test locations based on initial coordinates provided by Dominion. Boring locations were staked using RTK-GPS when possible. When tree canopy or other obstructions occurred, coordinate traverse points were established using RTK-GPS. Then, conventional survey was used to stake planned boring locations from those established traverse points. Stakes or flags 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 all testing. The surveyor returned to the site and determined locations and elevations of the actual test points. Once again, the surveyor used a combination of RTK-GPS and conventional survey to locate points.

The final survey was performed by Jeffrey F. Gilley, Land Surveyor, Virginia License No. 2439 and Christopher Evans, Survey Technician, both of the Virginia Beach Office of McKim & Creed, P.A. A Topcon 304 electronic total station surveying instrument, 5 arc second horizontal and vertical accuracy, a Trimble 5700 L1/L2 Real Time Kinematic (RTK) GPS system with two rover units, and a Trimble DiNi 22 digital differential level were used for this survey. Trimble and Tripod Data Systems data collectors using Ranger platforms were used to store the data. Field notes of occupations and differential leveling were kept as a backup of the data collectors. All of the equipment was tested prior to conducting the survey to ensure the equipment was functioning within the required parameters.

The origin for the as-built survey was Control Monument No. 7, a brass disk imbedded in concrete (Point No. 5010). The field survey was conducted using the same coordinate system and vertical datum as was used during the initial stakeout survey performed by McKim & Creed, P.A. in August 2006. Post, as-built survey coordinate translations and vertical adjustments were made to every point in the data set relative to Monument No. 7 (survey origin point). The new horizontal positions and vertical values for the data set coincide with the values 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 2006. The OPUS solution was generated on 4 January 2007 after precise orbital data was available.

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). The coordinate system and vertical datum used during the August 2006 survey were earlier versions of the VSPCS, South Zone, NAD 83 and NAVD 88. The delta (Δ) values for the OPUS solution applied to Control Monument No. 7 and the entire data set are as follows:

Mon 7 – Point 5010	Nov 06 Field Values	OPUS Δ Values	Jan 07 OPUS Position
Northing	3909877.58 usft	-2.60777	3,909,874.97 usft
Easting	11685941.43 usft	+2.0878	11,685,943.52 usft
Orthometric Height	303.89 usft	-0.12585	303.76 usft

The as-built survey locations provided by the surveyor were provided to Bechtel for their use in creating an as-built drawing of the exploration. The as-built drawing, issued by Dominion as NA EDWG-000-59-0-B666-0-CY-0100-00001, is included as Figure 2 in this report. 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.

2.2 Utility Location

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

Dominion personnel used electromagnetic and ground-penetrating radar methods to check the planned test locations for the presence of underground utilities. The planned locations were adjusted as required by Dominion to provide the necessary utility clearances. For all work completed after October 23, 2006 Virginia Miss Utility was notified by plant personnel at least 48 hours prior to drilling at a specific location. Virginia Miss Utility personnel then provided additional utility location services.

After October 23, 2006, "soft dig" techniques were used as a further measure to clear utilities. Using this method, Dominion personnel used an air driven probe and a vacuum truck to extend a hole approximately eight feet below existing grades. After completion of the "soft dig" excavation, plant personnel signed off utility clearance. A drill rig was then located to drill through the existing excavation. This method eliminated soil sampling to depth of the "soft dig" hole.

2.3 Drilling Equipment/Methods

MACTEC mobilized the following drilling equipment to the site:

Serial Marker	Owner	Drill Rig	Driller	Auto Hammer	Rock Core Sizes
212393	MACTEC	CME550	Akins/Cox	Y	HQ
209195	MACTEC	CME55	Meyerson	Y	HQ
04	MACTEC	CME45	Rhodes/Cox	Y	HQ
331145	MACTEC	CME 55 LC	White	Y	HQ

In addition, a rubber-tired ATV and a Ford F-250, each equipped with a water tank, were mobilized to the site and used to haul materials and water from Lake Anna to the drill rigs.

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). 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 advanced using wire-line rock coring equipment and procedures described in ASTM D 2113. Rock coring was accomplished utilizing an "HQ" sized core barrel with a split inner barrel or split triple tube. Four-inch-diameter casing was used to stabilize the upper portions of each boring as necessary.

Hollow stem augers, with a 4.25-inch inside diameter and a nominal 8-inch outside diameter, were used to advance the borings for the observation wells that terminated in soil. We did not collect soil samples from the borings for the observation wells because these borings were advanced adjacent to geotechnical borings. Except for well OW 951, the observation wells set into rock were installed using a rotary air percussion rig.

Observation well OW 951 was set into rock but was unable to be installed using the air rotary rig due to soft wet soils and gravel fill overlying the rock. Instead, OW 951 was installed into a hole cored using a "HQ" core barrel. Due to the limited clearances, a well sock was used instead of a sand pack around the screen. In addition a formation packer was used to seal the top of the screened interval prior to placement of the bentonite seal.

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

All boreholes and the CPT locations were filled with a cement-bentonite grout prior to demobilizing from the site. As required in Technical Scope of Work Section 5.13, 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 5.13 (8 gallons of water and 2.5 pounds of bentonite per 94-pound sack of cement). A stake or other marker was placed at each completed boring location for later survey use. The as-built 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

All rigs utilized on this project used automatic hammers for completing SPT testing. Due to the shallow rock encountered in many borings, SPT energy measurements were not completed while the rigs were on site. Instead, SPT energy measurement data from prior projects were used for two of the rigs, and energy measurements made after the rigs left the site were used for the remaining two rigs. Energy measurement reports for all four rigs are included in Appendix B.

The energy measurements at the off-site locations were performed with a Pile Driving Analyzer (PDA) model PAK and calibrated accelerometers and strain gages. A section of appropriately sized drill rod, 2 feet long and instrumented with dedicated strain gages, 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 done 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 was 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 gages and accelerometers, was calculated by the PDA using the EFV method equation, as shown below:

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

Where: EFV = Transferred energy (EFV equation), or Energy of FV
F(t) = Calculated force at time t
V(t) = Calculated velocity at time t

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 ETR is the ratio of the average measured energy to the theoretical potential energy of the SPT system (140-pound weight with the specified 30-inch fall).

The ETR range of the automatic hammers used at the site is 72% to 86.5% of the theoretical potential energy. These ETR values are within the range of typical values for automatic hammers. The ETR values as percent of the theoretical value are shown in Appendix B, Table B-1.

2.5 Sampling in Geotechnical Borings

2.5.1 Standard Penetration Test Sampling

Soil sampling in the geotechnical borings (B-901 through B-951) was conducted at intervals ranging from 2.5 feet to 5 feet using equipment and methods described in ASTM D 1586-99. For borings in the central plant area started after October 23, 2006, no sampling was done in the upper eight feet due to the utility clearance method described in Section 2.2.

Automatic hammers were used to perform the SPT tests. The sampler was typically driven 18 inches in soil with blows recorded for each six-inch interval of penetration. In very hard soils and weathered rock, driving was terminated at 50 blows and the actual penetration recorded, (e.g.. 50 blows / 3 inches).

The split spoon sampler was opened at the drill site and the recovered materials were visually described and classified by MACTEC's rig geologist. A selected portion of the sample, typically the material for the lower 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 storage area.

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 recovered by the coring process, which was done according to ASTM D 2113-99, 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 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). Grouting was used to abandon all borings except the Observation Wells to be used for groundwater monitoring, and the grouting is recorded on grouting field logs which are retained in the DCC.

2.5.3 Undisturbed Soil Sampling

Undisturbed soil samples were collected when directed by Dominion, using a 3-inch thin-walled tube sampler in accordance with ASTM D 1587-00. Undisturbed samples were typically obtained from borings offset from the original geotechnical sampling borings to assure collection of desired materials based on the review of the original boring. These offset borings are typically designated with an "A" (i.e. B-929A). Standard Penetration Testing and sampling was conducted between undisturbed sample intervals. Test boring records for the undisturbed sample borings are included in Appendix B.1.

When subsurface material was too dense or hard to allow satisfactory recovery of samples by pressing the tube sampler into the material, a Pitcher sampler was used as requested by Dominion. The Pitcher sampler is a rotary sampler that drills a 3-inch tube into the subsurface material. All undisturbed samples were sealed at the top and bottom against moisture loss, labeled, kept in an upright condition, and transported to the climate-controlled on-site storage area following ASTM D 4220-95.

2.6 Boring Logs

The soil descriptions on the boring logs in Appendix B.1 are based on the field descriptions (ASTM D 2488-00) by the rig geologist or engineer, modified according to ASTM D 2487-00 where lab test 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. The water depths on these 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 7 of the computer program "gINT".

2.7 Sampling in Geotechnical Test Pits

Test pits were excavated at six locations identified by Dominion. A rubber-tired backhoe was used to excavate the pits. The Bechtel field representative selected the materials to be sampled. A MACTEC rig geologist collected the bulk samples. As approved by Dominion, the bulk samples were placed in new 5-gallon plastic buckets with handles for carrying. One bucket of each sampled material was obtained. Small portions of the samples were placed in glass jars and sealed for moisture retention. The backhoe was used to backfill the test pits using the excavated materials. The backfilled materials were tamped in-place using the backhoe. The rig geologist placed a stake for later survey location.

The buckets and jar samples were labeled and transported to the on-site storage area. The rig geologist prepared a Geotechnical Test Pit Log based on visual description of the excavated materials according to ASTM D 2488-00. The Geotechnical Test Pit Logs are included in Appendix B.2. The surveyed locations of the test pits are shown in Table 2.4 and are also in Appendix A.

2.8 Cone Penetrometer Testing

Locations for 23 Cone Penetrometer Tests (CPT), designated as nos. C-901 through C-923, were included in the original scope of work for this project. Specified probe depths ranged from 25 to 100 feet below ground surface, or to refusal. MACTEC personnel staked the probes at the specified locations; however, due to presence of roads or underground utilities, some of the probes were relocated. All test locations were approved by Dominion and cleared by plant utility personnel prior to pushing. Results for all CPT testing are included in Appendix D. Following the CPT testing, the as-built horizontal coordinates and elevations were obtained at the test locations by survey. The coordinates and elevations are provided in Appendix A and in Table 2.3

CPT testing was conducted by Gregg InSitu, Inc. (Gregg), a subcontractor to MACTEC. Gregg used a track mounted 20-ton self-contained cone rig to complete the work. Each probe was advanced to the assigned termination depth or to cone refusal, which was the limit of the pushing capacity of the rig. Seismic testing was completed at intervals of approximately three feet in C-902, C-916, C-921, and C-923. Pore pressure dissipation tests were completed in C-902, C-904b, C-911 and C-917. All testing was done in accordance with the Technical Scope of Work and ASTM D 5778-95 (reapproved 2005).

Refusal was encountered at depths of less than 10 feet at four test locations: C-904, C-906, C-912 and C-913. Offset probes were attempted at all but C-912. The offset probes succeeded in penetrating beyond 10 feet at C-904 and C-913. At the other two locations, the probing was stopped without reaching 10 feet.

2.9 Field Electrical Resistivity Testing

Field electrical resistivity testing was conducted along two crossing lines located in the proposed administration building area of the site. The locations were adjusted from those shown on the Unit 3 Boring Location Plan with approval of Dominion and Bechtel due to topographic features, underground utilities that would interfere with the testing and limited space associated with the initial locations. Survey location of the center point of the line crossing was obtained and is indicated on the survey table in Appendix A as well as on the resistivity test report in Appendix E.1 The bearing of each line as measured by MACTEC in the field using a standard Brunton compass is also shown on the field data report.

The Wenner four-electrode method was used to perform the tests in accordance with ASTM G 57-95a (reapproved 2001). In the Wenner method, four electrodes – two for current and two for voltage – are spaced an equal distance apart and inserted into the ground about 12 inches. A current is imposed through the two outer electrodes, and the voltage is measured at the two inner electrodes. The spacing was increased following the specification requirements from 3 feet up to 100 feet (the maximum that could be done with the site conditions). The field test device allowed readings on both a high range and a low range gage, with the low range being more sensitive. The low-range readings were used to compute the apparent soil resistivity in accordance with the equations in ASTM G-57. The resistivity data interpreted from the tests are contained in Appendix E.1

2.10 Geophysical Down-hole Testing

Down-hole geophysical and televiewer logging was performed in three borings as assigned on the Boring Location Plan (B-901, B-907 and B-909). 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 E.2. The GEOVision report consists of two volumes – a text and graphical volume presented in Appendix E.2, 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 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.

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 B-901, 907 and -909 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.

SECTION 3
SAMPLE STORAGE

At the request of Dominion and consistent with MACTEC's quality requirements, an on-site sample storage facility was established. The 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 chain link fence 6 feet high, or in an adjacent "fixed" secured area provided by the plant. Locking gates were provided in both areas.

Samples were transported daily from the field to the sample storage room by the rig geologists/engineers. SPT samples were transported in their compartmentalized cardboard boxes, 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. The UD samples were transported according to ASTM D 4220-95.

A sample inventory log was kept at the sample storage facility. All samples entering the sample storage facility were logged in by the rig geologist or site supervisor. A chain of custody form was completed for all samples removed from the facility.

SECTION 4
LABORATORY TESTING – GEOTECHNICAL

Laboratory testing was conducted on disturbed, undisturbed, and remolded 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 and issued through Dominion. Dominion provided Geotechnical Laboratory Test Assignment Sheets dated September 25, November 3, November 15 and November 28, 2006 for geotechnical soil and rock laboratory testing. Each later assignment sheet supplemented the earlier sheets with new assignments.

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 Bechtel and they either assigned replacement tests on other samples or agreed to delete the assigned testing on the sample. An annotated copy of the last Geotechnical Laboratory Assignment Sheet showing which assigned tests were not conducted is included in Appendix F.

Testing of soil and rock samples, except for chemical tests and testing for resonant column torsional shear (RCTS), was conducted in MACTEC's laboratories in Raleigh and Charlotte, North Carolina and in Atlanta, Georgia. Chemical testing for pH, sulfates and chlorides in selected soil samples was done by Severn Trent Laboratory (STL) in Earth City, Missouri, a subcontractor to MACTEC.

RCTS testing of selected soil samples will be conducted by the Fugro Consultants' laboratory under the technical direction of Dr. K.H. Stokoe, a vendor to MACTEC, and submitted as a supplemental report. | Rev. 1

The following tests were assigned and performed:

4.1 Identification Tests

- Moisture content - ASTM D 2216-05
- Unit weight of soil
- Specific gravity of soil - ASTM D 854-06
- Sieve and hydrometer analysis - ASTM D 422-63 (2002) and ASTM D 6913-04
- Atterberg limits - ASTM D 4318-05
- Chemical analysis (pH, Chloride, Sulfate) - EPA SW9045 and 9056/300.0

4.2 Compaction and Strength Tests

- Moisture-density - ASTM D 1557-02
- California Bearing Ratio – ASTM D 1883-05
- Unconsolidated-undrained triaxial compression - ASTM D 2850-03a
- Consolidated – undrained - ASTM D 4767-04
- Specimen Preparation – Rock Core - ASTM D 4543-04
- Unconfined Compression – Rock ASTM D 7012-04
- Unconfined compression w/stress-strain – Rock - ASTM D 7012–04

4.3 Modulus and Damping Tests

- RCTS Tests ASTM - D 4015-92(2000) and Test Procedures and Calibration Documentation Associated with the RCTS and URC Tests at the University of Texas at Austin, DCN: UTSD RCTS GR06-4, April 25, 2006, Geotechnical Engineering Center, University of Texas, Austin, Texas.

4.4 Reporting

Except for the RCTS tests, the geotechnical laboratory test reports, consisting of individual test data and results sheets as required by the testing standard, are contained in Appendix F. Summaries of the test results in Appendix F are shown in Tables 3.1, 3.2, and 3.3 for soil and Table 4 for rock.

The RCTS tests, including the data and report supervised or approved by Dr. K. H. Stokoe, will be presented in a Supplemental Report when available. The classification tests on the RCTS samples will also be included in the Supplemental Report.

SECTION 5
WATER SAMPLING, FIELD AND LABORATORY TESTING

5.1 Well Installation

MACTEC installed four observation wells and Bedford Drilling, MACTEC's contractor, installed three observation wells on the site as part of this project. Well nos. OW-945, OW-946 and OW-947 were screened in the soil/weathered-rock zone, and well nos. OW-901, OW-949, OW-950 and OW-951 were screened in the rock. The wells were installed per the Technical Scope of Work. The well-construction details are shown in Observation Well Installation Records in Appendix C.1. Pertinent information for the observation wells is shown in Table 2.2.

The observation well depths and screen intervals were specified by Bechtel's hydrogeologist after review of adjacent borehole records, rock core and packer test results, where appropriate. Boreholes for the observation wells installed in the soil/weathered rock zone were advanced using hollow stem augers with a 4.25-inch inside diameter and a nominal 8-inch outside diameter. Boreholes for all but one of the observation wells installed in rock were advanced using air-rotary drilling techniques with a borehole diameter of 6 inches. The borehole for OW-951 was advanced with hollow stem augers with a 4.25-inch inside diameter and a nominal 8-inch outside diameter until encountering auger refusal, at which depth rock was cored with "HQ" size coring equipment to the base of the borehole. This method was approved by Bechtel's hydrogeologist and Dominion after presence of gravel fill and soft wet soil caused repeated cave-ins during the initial pneumatic drilling attempts by Bedford Drilling. MACTEC did not collect soil samples from the boreholes for the wells because these boreholes were adjacent to geotechnical borings, from which we had collected soil and rock data.

Borehole depths shown on the borehole logs indicate the total depth drilled and sampled. Due to small amounts of drill spoil at the base of the augers, or due to the sampler advancing beyond the augered depth, the total depth shown on the borehole log may be slightly greater than the well depth reported on the companion well installation record.

Upon reaching the designated depth for a well, slotted PVC casing connected to solid PVC riser was set, and a sand pack and bentonite seal were placed in all wells but OW-951. In this well, a filter sock instead of a sand pack was placed over the screen, above which a formation packer and bentonite seal were set. A grout plug was placed from the top of the bentonite seal to the ground surface in each borehole. The grout mix specified the Technical Scope of Work Section 5.13 was used.

Because the ground surface elevations at the well sites were not determined until after the well pads were placed, the elevation (as later determined) of the marked top of the PVC casing, less the casing stickup above ground surface as measured at the time of installation, was used to back-calculate the ground-surface elevation shown on the well installation records and the well boring logs. All water-depth measurements are referenced to the marked point on top of the PVC casing. The elevation of the top of casing was also used along with measurements of the well sections to calculate elevations for the well monitoring interval.

All wells were capped with a lockable steel well cover extending approximately two feet above grade. A concrete pad, two feet square and six inches thick, was also placed around each well cover as per the Technical Scope of Work.

5.2 Water-Level Measurements

MACTEC representatives measured the depth to the water table in each well at various times related to development, slug testing and water quality sampling using an electric water-level meter and referenced to the mark on the top of the riser. These water levels are shown on the various field forms in Appendix C.1. Record water levels were measured by Bechtel in all wells after the water sampling was completed.

5.3 Well Development

After well installation was completed, wells were developed by pumping in accordance with the Technical Scope of Work and a well development procedure submitted by MACTEC and approved by Bechtel's hydrogeologist. Two to three standing well volumes of water were purged initially by pumping, cycling the pump on and off to create a surging effect. After initial pumping, the procedure called for removal of six standing well volumes while monitoring pH and conductivity with a field meter and visually observing the turbidity. The wells were considered developed when the pH and conductivity stabilized and the pumped water was reasonably free of suspended sediment. Well development records are attached in Appendix C.1.

5.4 Well Purging and Sampling

MACTEC purged and sampled each well using a submersible pump that was set approximately one foot above the bottom of the well. We purged each well until field-measured indicator parameters of water quality "stabilized" and until we purged at least one well volume. Using a YSI 600 equipped with a flow-through cell, MACTEC measured the following field-indicator parameters in accordance with ASTM D 6452-99.

- Temperature
- pH
- Electrical conductivity (specific conductance)
- Turbidity
- Oxidation-reduction potential (redox)
- Dissolved oxygen

Stabilization of field parameters was based on three consecutive measurements showing values with the following criteria, made at intervals not less than one-half well volume or five minutes, whichever is greater, unless directed otherwise by Dominion:

- pH: ±0.1 pH units
- Dissolved oxygen: ±0.3 mg/liter
- Electrical conductivity: ±3 percent
- Oxidation-reduction potential: ±10 mv
- Turbidity ±1 nephelometric turbidity unit (NTU), or ±10 percent if greater than 10 NTUs

The pumping rate during well sampling was kept low enough to minimize sample turbidity, sample aeration, bubble formation, and turbulent filling of the sample containers. We used a sampling method consistent with "sampling based on fixed volume combined with indicator parameter stabilization" as described in ASTM D 6452-99. Well sampling record sheets are included in Appendix C.1.

5.5 Laboratory Testing

MACTEC filled the laboratory-provided sample containers with groundwater directly from the tubing attached to the pump. We placed the containers in a cooler with ice, and had the cooler delivered by overnight delivery to the Severn Trent Laboratory (STL) in Earth City, Missouri under chain-of-custody. STL tested the groundwater samples for the following parameters according to the current methods cited in "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020 using the methods cited:

- Total dissolved solids -- EPA Method 160.1
- Inorganic ions (bromide, chloride, fluoride, sulfate) -- EPA Method 300.0.
- Alkalinity (bicarbonate/carbonate) -- EPA Method 310.1.
- Ammonia -- EPA Method 350.1.
- Nitrate/nitrite -- EPA Method 353.1

The Technical Scope of Work originally indicated testing for sulfide was required as well as testing for sulfate. The laboratory tested only for sulfate, and through the non-conformance process, Dominion accepted deletion of sulfide and use of sulfate instead.

Also, the Technical Scope of Work listed cation/anion balance as a laboratory report item. Because no cations were included in the assigned analyses, not cation/anion balance could be computed, and none was reported.

Some samples were tested for nitrate and nitrite separately as well as for Nitrate/nitrite. Results from these un-assigned tests are included in the laboratory reports, if they were done.

The laboratory test results for water chemistry are presented in Appendix C.4. MACTEC's review of the laboratory results identified possible quality issues with some tests on OW-945, OW-947 and OW-951. Due to laboratory equipment breakdown, tests for anions were performed slightly outside the EPA-recommended hold times. Due to an internal error, tests for Ammonia on samples from OW-945 and OW-947 were performed using a reagent that was past its stated expiration date. MACTEC presented these results and our evaluation in a non-conformance that recommended the test results be accepted "as-is". Bechtel and Dominion reviewed the recommendation and concurred.

5.6 Field Permeability Testing

5.6.1 Packer Testing: Field permeability testing by the packer method was conducted in selected boring locations using test procedures described in ASTM D 4630, as modified by U.S. Army Corps of Engineers in their Rock Testing Handbook (RTH 381-80) to use a manually read flow meter rather than a digitally recorded one. The packer testing method involved establishing and maintaining a constant pressure in the packer test interval or test length, measured by an electronic transducer, and determining the rate of inflow associated with maintaining the pressure. The test method is thus known as the "constant head injection test".

Five pressure values were generally used in each test interval. A pressure transducer is placed within the test interval to measure the pressure directly. The boring locations for packer testing were identified on Bechtel Drawing No. 0-CY-0100-00001 (issued by

Dominion as their drawing number 59-0-B666-0-CY-0100-00001 on July 31, 2006) as B-901, B-949, B-950 and B-951.

Sections for testing were assigned by Bechtel's representative after review of rock core field logs. Test sections were either 5 or 10 feet in length. The purpose of the packer testing was to establish the coefficient of permeability (also called hydraulic conductivity) of the rock in the packer test length. Flow in the rocks at North Anna occurs only through discontinuities such as joints and fractures. In many of the tests, flow could not be established due to lack of sufficient connected discontinuities to provide flow paths away from the borehole. Often an initial amount of flow would be recorded followed by no flow the remainder of the test. In such cases, no average hydraulic conductivity was calculated. Table 5 summarizes the results of the packer tests; field data and calculations for each test are included in Appendix C.3.

5.6.2 Slug Testing: Field permeability testing was conducted in observation wells B-945, B-946, B-947 and B-949 as designated by Bechtel on the above-mentioned drawing. Observation well B-949 was not on the issued drawing; it was added during the field work by Bechtel representatives. The testing used procedures described in Section 8 of ASTM D 4044. The test procedure is commonly termed the slug test method. Slug testing involves establishing a static water level, lowering a solid cylinder into the well to cause an increase of water level in the well and monitoring the time rate for the well water level to return to the pre-test static level. This method is commonly called the "slug-in" method. After that stabilization, the slug is rapidly removed to create a lowering of the water level in the well, and the time rate for water to recover to the pre-test static level is recorded. This method is commonly called the "Slug-out" method. Electronic transducers and data loggers are used for measuring the water levels and times during the test.

A summary of the slug test results is provided in Table 6. The data logger output sheets as charts of water level versus time, and the calculation sheets are in Appendix C-2.

TABLE 1
ORGANIZATIONS PERFORMING WORK AT THE SITE OR IN THE LABORATORY

Organization	Function
MACTEC Engineering and Consulting, Inc.	• SPT tests; • Core Drilling; • Undisturbed Sampling; • Bulk Sampling; • Geotechnical Laboratory Testing for Soil and Rock samples; • SPT Energy Measurement on Drill Rigs; • Slug Testing; • Water Sampling; • Well Installation; • Logging of Soil and Rock; • Site Coordination, and; • Field Resistivity.
Gregg Drilling and Testing, Inc.	• CPT Tests.
Bedford Drilling, Inc.	• Observation Well Installation.
STL Laboratories	• Laboratory Chemical Testing Soil & Water Samples.
Miller Drilling, Inc.	• Packer Testing.
GEOVision	• Downhole Geophysical Logging; • Natural Gamma; • Short and Long Normal Resistivity; • 3-arm Caliper; • Acoustic Televiewer, and; • P-S Suspension Logging.
McKim and Creed, PA.	• Surveying of Borings, Observation Wells, CPTs, Test Pits and Field Electrical Resistivity Tests.
Fugro Consultants	• RCTS Tests (Results will be provided in a Supplemental Report).

Prepared By [illegible]
Checked By [illegible]

TESTING SUMMARY - Soil Borings

North Anna Nuclear Power Station
COL Project
MACTEC Project Number 6468061472

Boring Number	Boring Type			Depth (ft)		Coordinates			In-Situ Testing				Comments
	SPT HQ Core	SPT	UD Tubes	Proposed	Actual	Northing	Easting	Elevation	P-S Suspension	Borehole Televiewer	Down Hole Logging	Packer Test	
B-901	X		X	300	300	3,909,777.72	11,685,928.59	309.42	X	X	X	X	
B-902	X			200	201.7	3,909,874.19	11,685,884.28	302.20					
B-903	X			150	151	3,909,812.10	11,686,028.80	301.59					
B-904	X			150	151.7	3,909,692.47	11,685,970.43	316.75					
B-905	X			150	150.4	3,909,732.86	11,685,821.97	306.75					
B-906	X			150	150.5	3,909,670.03	11,685,795.34	311.72					
B-907	X			200	200.5	3,909,607.90	11,685,938.35	322.71	X	X	X		
B-908	X			150	151.4	3,909,716.65	11,686,060.89	307.71					
B-909	X			200	201.9	3,909,695.46	11,686,107.40	304.90	X	X	X		
B-910	X			150	148.4	3,909,667.63	11,685,883.11	316.54					
B-911	X			100	101	3,909,919.91	11,685,992.68	299.79					
B-911A			X	N/A	21.7	3,909,916.04	11,686,000.53	299.91					
B-912	X			150	151.8	3,910,021.70	11,686,051.36	275.10					
B-913	X			100	100.9	3,910,148.50	11,686,114.71	273.37					
B-914	X			200	200.5	3,909,939.55	11,685,922.35	297.45					
B-915	X			150	112.8	3,909,877.48	11,686,088.55	301.79					
B-916	X			100	100.3	3,910,049.54	11,686,008.70	276.24					
B-917	X			150	150.8	3,910,160.68	11,686,029.45	274.85					
B-918	X			150	150.1	3,910,115.28	11,686,194.05	272.13					
B-919	X			75	76.2	3,909,575.39	11,685,764.67	317.79					
B-920	X			150	150.7	3,909,545.07	11,685,980.20	327.17					
B-921		X		75	73.9	3,909,680.19	11,686,162.71	307.96					
B-921A			X	N/A	40.4	3,909,686.89	11,686,161.68	307.39					
B-922	X			75	26	3,909,943.65	11,686,232.99	271.30					Hole abandoned and offset due to utility conflict.
B-922A	X			75	76.5	3,909,949.30	11,686,244.02	271.33					
B-923	X			75	75.4	3,910,076.97	11,686,309.48	272.00					
B-924	X			75	75.6	3,909,969.53	11,686,475.40	271.52					
B-925	X			75	75.8	3,910,036.67	11,686,576.27	270.01					
B-926	X			150	155.5	3,910,043.20	11,685,709.26	289.03					
B-927	X			100	100.4	3,909,966.07	11,685,878.59	292.51					
B-928	X			75	75.2	3,910,222.75	11,686,159.07	272.17					
B-928A			X	N/A	37.5	3,910,220.39	11,686,165.35	271.82					
B-929		X	X	75	74	3,909,214.44	11,685,654.82	329.02					
B-929A			X	N/A	52.5	3,909,214.15	11,685,665.51	329.03					
B-930		X		75	123.6	3,909,275.95	11,685,842.87	326.12					
B-931		X		75	74	3,910,152.94	11,685,921.54	278.52					
B-932		X		75	35.1	3,910,444.31	11,686,415.70	249.88					
B-933	X			100	100.3	3,909,827.41	11,685,790.97	296.48					
B-933A			X	N/A	27.5	3,909,826.28	11,685,802.01	296.58					
B-934	X			100	101.6	3,909,860.37	11,685,686.09	294.80					
B-935				75	0								Boring Deleted
B-936	X			100	100.7	3,910,745.87	11,685,929.15	286.56					
B-937	X			75	55.3	3,910,688.52	11,686,672.12	270.25					
B-938				75	0								Boring Deleted
B-939	X			75	76.1	3,911,317.60	11,686,605.91	254.03					
B-940	X			75	76.1	3,910,266.77	11,688,901.02	268.32					
B-941	X			75	75.8	3,910,403.63	11,688,912.87	267.19					
B-942	X			100	100.8	3,909,614.69	11,684,326.45	291.85					
B-943	X			100	101.9	3,909,355.39	11,683,892.47	300.40					
B-944	X			100	86.4	3,908,772.38	11,684,127.62	334.69					
B-945	X			100	100.6	3,910,135.55	11,683,779.79	281.51					
B-946	X			100	100.7	3,908,787.24	11,683,810.59	333.36					
B-947		X		100	88.8	3,909,574.53	11,686,367.21	312.48					
B-948	X			100	100.6	3,909,619.26	11,685,565.69	310.41					
B-949	X			100	106.4	3,909,018.09	11,685,157.27	334.82					
B-950	X			100	100.8	3,910,835.82	11,686.282.11	282.50				X	
B-951	X			100	101	3,910,548.26	11,686,821.80	249.93				X	

Prepared By SJC
Checked By MPR

TESTING SUMMARY - OBSERVATION WELLS
North Anna Nuclear Power Station
COL Project
MACTEC Project Number 6468061472

Well Number	Installation Method		Depth (ft)		Coordinates				Casing Diameter		Testing		Comments
	Air Rotary	Hollow Stem Auger	Proposed Max.	Actual	Northing	Easting	TOC Elevation	Pad Elevation	2-inch	4-inch	Slug Testing	Sampling for Chemistry	
OW 901	X		100	108	3,909,772.32	11,685,917.49	311.32	309.62	X			X	
OW 945		X	50	54.5	3,910,136.49	11,683,793.31	283.08	281.56	X		X	X	
OW 946		X	50	43.4	3,908,787.97	11,683,822.73	335.58	334.04	X		X	X	
OW 947		X	100	58	3,909,579.58	11,686,371.84	315.08	313.30	X		X	X	
OW 949	X		100	105	3,909,025.20	11,685,153.35	336.91	335.67	X		X	X	
OW 950	X		100	92	3,910,842.18	11,686,285.15	284.49	282.98	X			X	
OW 951		X*	100	67	3,910,521.44	11,686,786.01	250.68	249.69	X			X	
OW 951A	N/A	N/A	0	40	3,910,523.68	11,686,814.13	N/A	N/A	N/A				Hole Caved, Well Not Installed
OW 951B	N/A	N/A	0	67.2	3,910,489.56	11,686,818.46	N/A	N/A	N/A				Hole Caved, Well Not Installed

* OW951 set with Hollow Stem Augers and HQ Core

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Checked By MBC

TESTING SUMMARY - CPT
North Anna Nuclear Power Station
COL Project
MACTEC Project Number 6468061472

CPT Number	Depth	Testing		Coordinates			Comments
	Actual	Seismic	Pore Pressure Dissipation	Northing	Easting	Elevation	
C-901	20.0			3,909,627.77	11,686,012.67	318.56	Refusal at 15.1' on first attempt
C-902	29.0	X	X	3,909,552.59	11,685,842.21	323.66	
C-903	29.0			3,909,719.02	11,685,775.66	306.84	
C-904	35.5		X	3,910,026.29	11,685,793.52	283.92	Refusal at 2.3' and 2.5 feet on first two attempts
C-905	45.6			3,910,137.61	11,685,857.21	279.29	
C-906	2.6			3,910,013.77	11,686,269.94	270.75	Refusal at 1.6' and 2.1 feet on first two attempts
C-907	13.1			3,910,174.67	11,686,277.14	271.66	
C-908	28.1			3,910,326.76	11,686,187.39	271.91	
C-909	60.0			3,909,346.74	11,685,717.77	330.26	
C-910	25.1			3,909,154.43	11,685,782.42	326.99	Refusal at 15.3' on first attempt
C-911	15.3		X	3,910,716.79	11,685,941.76	286.69	
C-912	2.8			3,909,959.42	11,686,349.77	271.16	
C-913	20.0			3,910,999.95	11,686,812.54	268.65	Refusal at 1.8' on first two attempts
C-914	31.0			3,910,360.20	11,688,917.62	267.86	
C-915	54.0			3,909,784.60	11,686,794.40	320.92	
C-916	49.1	X		3,909,584.68	11,686,372.70	312.91	
C-917	49.2		X	3,909,337.29	11,686,293.79	320.37	
C-918	25.1			3,909,151.49	11,685,509.11	329.55	
C-919	25.1			3,909,154.30	11,685,255.41	338.06	
C-920	25.1			3,909,071.70	11,685,870.40	324.73	
C-921	30.0	X		3,910,112.20	11,685,717.17	281.10	
C-922	20.3			3,909,889.28	11,684,055.95	311.73	
C-923	22.2	X		3,910,107.49	11,683,828.42	283.03	

Prepared By SJC
Checked By MPL

TESTING SUMMARY - TEST PITS & ELEC. RESISTIVITY

North Anna Nuclear Power Station
COL Project
MACTEC Project Number 6468061472

Test Pit Number	Coordinates			Comments
	Northing	Easting	Elevation	
TP-1	3,909,777.09	11,685,935.73	309.52	2 Bulk Samples
TP-2	3,909,610.00	11,685,932.34	322.18	2 Bulk Samples
TP-3	3,909,702.79	11,686,076.24	306.50	2 Bulk Samples
TP-4	3,909,887.87	11,686,109.68	299.76	2 Bulk Samples
TP-5	3,910,163.65	11,686,033.65	274.75	1 Bulk Sample
TP-6	3,909,971.90	11,685,884.07	291.98	1 Bulk Sample

Electrical Resistivity	Coordinates			Comments
	Northing	Easting	Elevation	
R1/R2	3,909,183.87	11,685,747.21	328.15	

TABLE 3.1
SUMMARY OF SOIL TEST RESULTS
NORTH ANNA NUCLEAR POWER STATION - COL PROJECT
MACTEC PROJECT # 6468-06-1472

Prepared By
Checked By

Boring Number	Sample Number	Depth (ft)	Sample Type	Gravel (1) (%)	Sand (1) (%)	Fines (2) (%)	Silt (1) (%)	0.005 mm Clay (1) (%)	USCS Symbol	Natural Moisture (%)	LL	PI	G_s	pH (3)	Chloride (mg/kg) (3), (6), (7)	Sulfate (mg/kg) (3), (6), (7)
B-901	B-901-2	3.5-5.0	SPT	0.0	53.6	46.4	10.8	35.6	(8)	21.5	(8)	(8)	(8)	(8)	(8)	(8)
B-901	B-901-4	11.5-13.0	SPT	0.0	76.6	23.4	16.0	7.4		10.2				5.8	ND (5)	ND (5)
B-901	B-901-6	22.2-23.7	SPT	0.0	76.8	23.2				16.4						
B-901	B-901-9	37.2-38.7	SPT	0.7	71.9	22.5	15.2	7.3		16.4						
B-901	UD-2	9.5-11.5 (4)	UD	0.0	78.0	22.0	12.6	9.4		15.0						
B-902	B-902-2	3.5-5.0	SPT	0.0	86.1	13.9				5.6						
B-902	B-902-4	8.5-10.0	SPT	1.3	71.0	29.0	13.4	15.6	SM	23.9	33	7				
B-902	B-902-6	13.5-15.0	SPT	0.0	80.0	20.0				14.0						
B-907	B-907-2	3.5-5.0	SPT	0.0	67.0	33.0	17.7	15.3	SM	14.0	33	8				
B-907	B-907-3	5.5-7.0	SPT	0.0	74.9	25.1				16.4				4.8	51.1 J	ND (5)
B-907	B-907-5	11.0-12.5	SPT	0.0	76.0	24.0				20.2						
B-907	B-907-7	17.5-19.0	SPT	0.0	80.9	19.1	11.7	7.4		12.3						
B-907	B-907-9	27.5-29.0	SPT	0.0	73.9	26.1										
B-907	B-907-10	32.5-34.0	SPT	0.0	66.6	23.4										
B-908	B-908-3	6.0-7.5	SPT	2.0	72.6	25.4	11.6	13.8		12.3			2.62			
B-908	B-908-6	13.5-15.0	SPT	0.0	76.6	23.4							2.69			
B-908	B-908-8	23.7-25.2	SPT	0.0	68.1	31.9										
B-908	B-908-13	47.1-48.6	SPT	0.0	76.0	24.0	18.9	5.1		14.5						
B-909	B-909-3	6.0-7.5	SPT	0.0	66.9	33.1	19.3	13.8	SM	25.9	57	12				
B-909	B-909-5	11.0-12.5	SPT	0.0	77.6	22.4				31.4				5.4	137 J	6.7
B-909	B-909-7	18.5-20.0	SPT	0.0	63.7	36.3	29.0	7.3	SM	25.1	30	4				
B-909	B-909-8	23.5-25.0	SPT	1.7	56.1	42.2				35.4						
B-909	B-909-12	41.9-43.4	SPT	0.0	75.3	24.7				17.6						
B-910	B-910-2	3.5-5.0	SPT	4.0	31.9	64.1	12.1	52.0		27.7						
B-910	B-910-5	11.0-12.5	SPT							30.5	45	13		5.8	3.6 J	5.1 B
B-910	B-910-7	18.5-20.0	SPT	0.0	46.4	53.6	43.1	10.5		33.1						
B-910	B-910-9	25.9-27.4	SPT	2.3	76.3	21.4				14.6				6.7	5.2 J	4.2 B
B-911	B-911-2	3.5-5.0	SPT	0.3	59.1	40.6				12.8						
B-911	B-911-4	8.0-9.5	SPT	0.0	70.6	29.4	13.6	15.8		19.6						

Prepared By JDR
Checked By SJC

TABLE 3.1
SUMMARY OF SOIL TEST RESULTS
NORTH ANNA NUCLEAR POWER STATION - COL PROJECT
MACTEC PROJECT # 6468-06-1472

Boring Number	Sample Number	Depth (ft)	Sample Type	Gravel (1) (%)	Sand (1) (%)	Fines (2) (%)	Silt (1) (%)	0.005 mm Clay (1) (%)	USCS Symbol	Natural Moisture (%)	LL	PI	G_s	pH (3)	Chloride (mg/kg) (3), (6), (7)	Sulfate (mg/kg) (3), (6), (7)
B-911	B-911-5	11.0-12.5	SPT	0.0	78.3	21.7								5.6	3.4 [J]	ND [(5)]
B-911	B-911-7	18.5-20.0	SPT	0.1	80.0	19.9				11.1						
B-912	B-912-1	9.1-10.6	SPT	0.0	73.7	26.3	20.8	5.5		24.0						
B-912	B-912-3	14.1-15.6	SPT	0.0	72.6	27.4				15.2						
B-912	B-912-4	19.1-19.9	SPT	14.5	84.9	0.6				15.7						
B-913	B-913-8	43.5-48.5	SPT	0.0	72.3	27.7										
B-914	B-914-2	3.5-5.0	SPT	0.1	52.9	47.0	21.0	26.0	SC	16.6	27	10				
B-914	B-914-3	6.0-7.5	SPT	4.0	63.0	33.0										
B-914	B-914-5	11.0-13.5	SPT	2.1	78.0	19.9										
B-914	B-914-7	19.0-20.5	SPT	27.8	61.0	11.2	8.6	2.6		20.8						
B-914	B-914-9	35.6-37.1	SPT	5.7	70.1	24.2								6.8	8.4 [J]	ND [(5)]
B-914	B-914-10	40.6-42.1	SPT	0.1	74.4	25.5	19.5	6.0		20.5						
B-917	B-917-13	48.5-53.5	SPT	0.0	81.9	18.1	15.0	3.1								
B-918	B-918-2	1.8-3.2	SPT	1.2	85.7	13.1	7.3	5.8		15.8			2.68			
B-918	B-918-3	5.1-6.6	SPT	0.0	85.0	15.0				13.3				6.9	8.0 [J]	9.4
B-918	B-918-4	9.3-10.8	SPT	0.0	80.6	19.4	13.4	6.0		13.7						
B-918	B-918-6	13.2-14.7	SPT	0.0	77.7	22.3				13.9						
B-918	B-918-8	22.4-23.9	SPT	1.4	79.4	19.2				17.8						
B-919	B-919-1	1.5-3.0	SPT							18.6	32	11				
B-919	B-919-3	5.9-7.4	SPT	2.5	80.9	16.6				11.1						
B-919	B-919-5	11.0-12.5	SPT	0.6	80.4	19.0				11.2						
B-919	B-919-7	18.9-19.4	SPT	3.7	75.5	20.8	10.8	10.0		13.8						
B-919	B-919-13	51.3-52.8	SPT	0.0	65.9	34.1	26.0	8.1		17.9						
B-920	B-920-1	2.0-3.5	SPT							25.2						
B-920	B-920-2	3.8-5.3	SPT											5.9	1.5 [B J]	7.5
B-920	B-920-3	6.0-7.5	SPT	0.3	58.9	40.8				24.1						
B-920	B-920-6	13.8-15.3	SPT							15.7				6.5	63.0 [J]	7.5
B-920	B-920-7	18.8-20.3	SPT	0.0	72.3	27.7	21.3	6.4		15.4						
B-920	B-920-9	27.3-28.8	SPT	0.0	79.9	20.1				19.5						
B-920	B-920-12	43.5-44.7	SPT							12.9				6.9	1.4 [B J]	2.3 [B]

Prepared By
Checked By

TABLE 3.1
SUMMARY OF SOIL TEST RESULTS
NORTH ANNA NUCLEAR POWER STATION - COL PROJECT
MACTEC PROJECT # 6468-06-1472

Boring Number	Sample Number	Depth (ft)	Sample Type	Gravel [1] (%)	Sand [1] (%)	Fines [2] (%)	Silt [1] (%)	0.005 mm Clay [1] (%)	USCS Symbol	Natural Moisture (%)	LL	PI	G_s	pH [3]	Chloride (mg/kg) [3], [6], [7]	Sulfate (mg/kg) [3], [6], [7]
B-921	B-921-1	1.5-3.0	SPT	11.5	52.1	36.4				12.0						
B-921	B-921-3	6.0-7.5	SPT	0.0	41.3	58.7	29.2	29.5	CL	24.8	34	14				
B-921	B-921-4	8.5-10.0	SPT	0.0	53.5	46.5	37.3	9.2		28.0				7.0	4.4 [J]	10.8
B-921	B-921-6	13.5-15.0	SPT	0.0	74.2	25.8	16.1	9.7		26.0						
B-921	B-921-8	23.8-25.3	SPT							32.1	38	NP				
B-921	B-921-10	33.8-35.3	SPT	0.0	75.5	24.5				20.4						
B-921	B-921-11	38.8-40.3	SPT	0.0	81.3	18.7				15.8						
B-921	B-921-16	63.8-65.3	SPT	0.0	75.1	24.9	18.2	6.7		8.5						
B-923	B-923-2	3.3-4.8	SPT	10.9	55.5	33.6	16.7	16.9	SC	22.5	33	10				
B-924	B-924-2	3.5-5.0	SPT	23.2	65.8	11.0	7.9	3.1		2.1						
B-924	B-924-3	6.0-7.5	SPT	11.1	74.5	14.4				4.8						
B-927	B-927-1	1.5-3.0	SPT	0.0	61.4	38.6	12.6	26.0	SC	14.1	28	10				
B-927	B-927-2	3.5-5.0	SPT	0.0	75.8	24.2				11.7						
B-927	B-927-3	6.0-7.5	SPT	0.0	73.2	26.8	17.1	9.7		12.2						
B-927	B-927-4	8.5-10.0	SPT	0.0	83.3	16.7				6.8				5.8	2.8 [J]	4.3 [B]
B-927	B-927-6	13.5-15.0	SPT	0.0	81.2	18.8				11.2						
B-927	B-927-7	18.5-20.0	SPT	0.0	76.2	23.8				11.4						
B-927	B-927-8	23.5-25.0	SPT	0.0	79.7	20.3				15.7				7.4	5.6 [J]	3.4 [B]
B-928	B-928-2	3.5-5.0	SPT	0.0	78.4	21.6				17.9						
B-928	B-928-4	8.3-9.8	SPT	0.0	73.4	26.6				18.5				6.8	120.0 [J]	4.9 [B]
B-928	B-928-6	14.0-15.5	SPT	0.0	77.0	23.0	17.8	5.2		24.5						
B-928	B-928-8	22.1-23.6	SPT	0.0	78.7	21.3				17.0						
B-928	B-928-9	27.1-28.6	SPT	0.0	74.7	25.3	19.2	6.1		16.4						
B-928 A	UD-3	20-22 [4]	UD	0.0	82.0	18.0	13.2	4.8								
B-929	B-929-1	1.5-3.0	SPT	12.2	43.7	44.1	16.6	27.5	SC	14.5	36	17				
B-929	B-929-2	3.5-5.0	SPT								54	16				
B-929	B-929-4	8.7-10.2	SPT	0.0	65.5	34.5				18.9				5.9	2.8 [J]	2.7 [B]
B-929	B-929-5	13.5-15.0	SPT	0.0	73.8	26.2				19.6						
B-929	B-929-7	23.0-24.5	SPT	0.0	76.9	23.1	17.0	6.1		18.8						
B-929	B-929-9	33.0-34.5	SPT	0.0	82.7	17.3				16.9						

TABLE 3.1
SUMMARY OF SOIL TEST RESULTS
NORTH ANNA NUCLEAR POWER STATION - COL PROJECT
MACTEC PROJECT # 6468-06-1472

Prepared By [signature]
Checked By SJC

Boring Number	Sample Number	Depth (ft)	Sample Type	Gravel [1] (%)	Sand [1] (%)	Fines [2] (%)	Silt [1] (%)	0.005 mm Clay [1] (%)	USCS Symbol	Natural Moisture (%)	LL	PI	G_s	pH [3]	Chloride (mg/kg) [3], [6], [7]	Sulfate (mg/kg) [3], [6], [7]
B-929	B-929-11	43.0-44.5	SPT	0.7	81.4	17.9				17.2						
B-929	B-929-13	53.0-54.5	SPT	0.0	80.0	20.0				13.8						
B-929A	UD-1	15.0-16.8 [4]	UD	0.0	78.6	21.4	15.1	6.3		13.1						
B 929 A	UD-6	40-41.8 [4]	UD	0.0	83.3	16.7	11.7	5.0		16.9						
B-931	B-931-10	47.3-48.8	SPT	0.0	78.5	21.5	15.9	5.6								
B-932	B-932-5	19.0-20.5	SPT	0.0	77.7	22.3	15.7	6.6		21.5						
B-933	B-933-3	6.0-7.5	SPT	0.0	62.3	37.7	22.6	15.1	SM	24.2	28	3				
B-933	B-933-5	11.2-12.7	SPT	0.0	58.8	41.2				25.9				5.4	210 J	3.0 B
B-933	B-933-7	19.5-21.0	SPT	0.0	76.6	23.4				26.7						
B-933	B-933-8	24.5-25.0	SPT	0.0	80.5	19.5				18.7						
B-945	B-945-1	1.5-3.0	SPT	0.0	82.0	18.0				14.5						
B-945	B-945-3	4.7-6.2	SPT	0.0	75.5	24.5	16.2	8.3		15.9						
B-945	B-945-5	11.3-12.8	SPT	0.0	84.2	15.8				21.6				6.4	6.9 J	3.1 B
B-945	B-945-7	19.4-20.9	SPT	0.0	84.8	15.2				27.6			2.58			
B-945	B-945-9	27.8-29.4	SPT	0.0	82.9	17.1	10.2	6.9		24.1						
B-945	B-945-11	39.4-40.9	SPT	0.0	90.1	9.9				20.4						
B-945	B-945-13	49.4-50.9	SPT	0.0	90.3	9.7				15.6						
B-947	B-947-1	1.5-3.0	SPT							16.7	55	25	2.60			
B-947	B-947-3	4.5-6.0	SPT	0.0	38.3	61.7	23.5	38.2	MH	36.0	56	19				
B-947	B-947-4	8.5-10.0	SPT	0.0	60.0	40.0			SM	20.7	38	9				
B-947	B-947-5	9.5-11.0	SPT	1.6	55.9	42.5	21.1	21.4		28.2			2.78			
B-947	B-947-6	13.5-15.0	SPT	0.0	30.5	69.5				22.5						
B-947	B-947-7	17.2-18.7	SPT	0.0	75.8	24.2				21.1				6.4	21.4 J	6.4
B-947	B-947-8	22.2-23.7	SPT	0.6	79.4	20.0	10.7	9.3		24.3						
B-947	B-947-9	28.7-30.2	SPT	0.0	66.6	33.4				28.8	33	NP				
B-947	B-947-10	33.7-35.2	SPT	0.0	81.3	18.7				20.2						
B-947	B-947-11	38.7-40.2	SPT	0.0	85.8	14.2				16.9						
B-947	B-947-12	42.2-43.7	SPT	0.0	79.7	20.3	13.4	6.9		20.5						

Prepared By [signature]
Checked By SJC

TABLE 3.1
SUMMARY OF SOIL TEST RESULTS
NORTH ANNA NUCLEAR POWER STATION - COL PROJECT
MACTEC PROJECT # 6468-06-1472

Boring Number	Sample Number	Depth (ft)	Sample Type	Gravel (1) (%)	Sand (1) (%)	Fines (2) (%)	Silt (1) (%)	0.005 mm Clay (1) (%)	USCS Symbol	Natural Moisture (%)	LL	PI	G_s	pH (3)	Chloride (mg/kg) (3), (6), (7)	Sulfate (mg/kg) (3), (6), (7)
B-948	B-948-1	1.5-3.0	SPT	0.0	54.7	45.3				83.7						
B-948	B-948-3	6.0-7.5	SPT	0.0	51.1	48.9				16.2				5.7	3.8 J	ND (5)
B-948	B-948-5	9.5-11.0	SPT	0.0	31.0	69.0	61.9	7.1		13.7						
B-948	B-948-7	18.5-20.0	SPT	0.0	35.9	64.1				15.2						
B-948	B-948-8	23.5-24.4	SPT	0.0	77.7	22.3				13.6						
B-951	B-951-8	23.0-24.5	SPT	0.2	82.9	16.9	10.5	6.4		13.9						

(1) Due to computer roundoff, particle size fractions may total 100 ± 1. Fines include silt plus clay.
(2) Fines include silt plus clay.
(3) Tests performed by STL - St. Louis, MO
(4) Depth interval shown reflects total pushed depth of UD tube.
(5) ND indicates analyte not detected at or above the Method Detection Limit
(6) B = Estimated Result. Analyte detected above the Method Detection Limit but not above the Reporting Limit.
(7) J = Method blank contamination. The associated method blank contains the target analyte at a reportable level
(8) Shaded cells [ ] indicate that information not obtained.

TABLE 3.2
SUMMARY OF SOIL TRIAXIAL TEST RESULTS
NORTH ANNA NUCLEAR POWER STATION - COL PROJECT
MACTEC PROJECT # 6468-06-1472

Prepared By SJC
Checked By JA

Source of Sample	Sample No.	Sample Depth [1] (ft)	Sample Type	Test Type	C' (psf)	Φ' (degree)	C (psf)	Φ (degree)	Comment
B-901	UD-2	9.5-11.5	UD Tube	CU	0.0	33.6	0.0	37.5	
B-928 A	UD-3	20-22	UD Tube	CU	423.4	31.4	103.7	41.2	
B-929 A	UD-1	15-16.75	UD Tube	CU	5.4	32.4	178.6	35.8	Only 2 points tested due to limited sample
B-929 A	UD-4	30-31.5	UD Tube	CU	0.0	33.0	0.0	33.0	Only 2 points tested due to limited sample
B-929 A	UD-6	40-41.5	UD Tube	CU	0.0	36.1	318.2	36.4	
B-933 A	UD-2	15-16.25	UD Tube	CU	55.0	32.6	479.5	30.5	Only 2 points tested due to limited sample

(1) Sample depth shown reflects the depth of start of push plus the length of the recovered sample

TABLE 3.3

SUMMARY OF SOIL MOISTURE/DENSITY AND CBR TEST RESULTS
NORTH ANNA NUCLEAR POWER STATION - COL PROJECT
MACTEC PROJECT # 6468-06-1472

		Moisture / Density Results [A]			CBR Results [B]			
Source of Sample	Sample No.	Natural Moisture	Maximum Dry Density	Optimum Moisture	Molded Density	Molded Moisture	Soaked CBR (0.10")	Soaked CBR (0.20")
		(%)	(pcf)	(%)	(pcf)	(%)	(%)	(%)
Test Pit 1	TP-1-1	23.4	108.7	17.6	Not Tested			
Test Pit 1	TP-1-2	22.6	108.8	17.1	90.3	17.0	1.2	1.6
					94.4	17.0	6.3	5.5
					105.3	17.2	14.7	15.6
Test Pit 2	TP-2	22.6	100.4	22.3	83.0	22.8	1.1	1.1
					89.1	22.0	1.3	1.2
					101.0	22.0	6.2	6.5
Test Pit 3	TP 3-1	16.1	124.9	9.5	Not Tested			
Test Pit 3	TP 3-2	12.4	124.5	10.9	117.5	10.7	5.9	6.0
					122.9	10.6	3.2	5.0
					125.6	10.5	4.2	8.4
Test Pit 4	TP 4-1	30.2	108.6	17.1	Not Tested			
Test Pit 4 [C]	TP 4-2	15.2	125.5	10.8	119.4	11.0	4.9	7.3
					121.5	10.6	8.8	11.9
Test Pit 5	TP 5	9.4	126	9.2	Not Tested			
Test Pit 6	TP 6	18.2	116.1	13.2	110.3	12.3	6.9	8.0
					111.7	12.7	6.4	9.5
					115.1	12.3	12.1	13.8

[A] Proctor Test results, ASTM D 1557-02 Method A Modified
[B] California Bearing Ratio Test results, ASTM D 1883-05 (section 7.12)
[C] Insufficient Material for three tests

Prepared By ZB
Checked By MA

Prepared By JBY
Checked By SJZ

TABLE 4
LABORATORY TEST RESULTS - ROCK
North Anna Power Station - COL Project
MACTEC PROJECT NO. 6468-06-1472

Boring No.	Run Number	Sample Top Depth (ft)	Sample Length (L) (Inches)	Sample Diameter (D) (inches)	L/D Ratio	Unit Weight (pcf)	Type of Break (1)	Unconfined Compressive Strength (psi)(2)	Young's Modulus (psi) (psi)	Poisson's Ratio
B-901	5	54.0	5.27	2.49	2.1	160	Shear	4,375	*(ND)* 3	*(ND)*
B-901	7	60.3	5.27	2.49	2.1	162	Columnar	15,425	3,970,000	* (4)
B-901	14	97.9	5.34	2.50	2.1	162	C&S	12,629	*(ND)*	*(ND)*
B-901	25	129.5	5.35	2.49	2.1	164	C&S	14,171	*(ND)*	*(ND)*
B-901	34	170.5	5.33	2.40	2.2	168	Shear	10,865	5,360,000	0.31
B-901	42	208.5	5.32	2.40	2.2	163	Shear	12,777	*(ND)*	*(ND)*
B-901	51	240.5	5.35	2.39	2.2	165	C&S	23,619	*(ND)*	*(ND)*
B-901	59	280.5	5.36	2.39	2.2	164	C&S	25,335	8,320,000	0.39
B-902	3	27.3	5.29	2.38	2.2	162	C&S	14,947	4,090,000	* (4)
B-902	9	47.4	5.35	2.40	2.2	163	Shear	21,007	*(ND)*	*(ND)*
B-902	14	72.3	5.34	2.40	2.2	164	C&S	25,100	*(ND)*	*(ND)*
B-902	18	92.8	5.32	2.40	2.2	164	Shear	6,030	1,840,000	0.42
B-902	28	141.9	5.31	2.40	2.2	170	Shear	6,982	*(ND)*	*(ND)*
B-902	38	184.6	5.36	2.40	2.2	163	C&S	27,303	*(ND)*	*(ND)*
B-907	3	51.9	5.29	2.45	2.2	152	Shear	957	*(ND)*	*(ND)*
B-907	12	90.0	5.23	2.46	2.1	155	Shear	751	*(ND)*	*(ND)*
B-907	24	116.8	5.27	2.47	2.1	173	Shear	4,599	*(ND)*	*(ND)*
B-907	27	131.8	5.32	2.48	2.1	173	C&S	8,519	*(ND)*	*(ND)*
B-907	33	160.8	5.32	2.50	2.1	163	Columnar	19,333	7,700,000	0.30
B-907	40	200.0	5.35	2.50	2.1	165	C&S	20,166	*(ND)*	*(ND)*

(1) Type of Breaks: Columnar; Cone (C); Shear (S); Cone & Shear (C&S)
(2) Unconfined compressive strength corrected for L/D Ratio
Compressive strength testing was performed in general accordance with ASTM D7012-04.
(3) (ND) indicates that information was not determined
(4) Value of Poisson's ratio is greater than 0.5 which indicates inelastic behavior probably due to presence of fractures or discontinuities affecting lateral strain

Prepared By JAY
Checked By SOR

TABLE 4
LABORATORY TEST RESULTS - ROCK
North Anna Power Station - COL Project
MACTEC PROJECT NO. 6468-06-1472

Boring No.	Run Number	Sample Top Depth (ft)	Sample Length (L) (Inches)	Sample Diameter (D) (inches)	L/D Ratio	Unit Weight (pcf)	Type of Break (1)	Unconfined Compressive Strength (psi)(2)	Young's Modulus (psi) (psi)	Poisson's Ratio
B-908	2	67.5	5.32	2.38	2.2	163	Shear	5,476	*(ND)* 3	*(ND)*
B-908	4	79.4	5.25	2.39	2.2	164	C&S	14,695	3,400,000	0.41
B-908	7	96.0	5.31	2.39	2.2	163	Shear	17,164	*(ND)*	*(ND)*
B-908	11	112.7	5.32	2.38	2.2	178	Shear	15,284	*(ND)*	*(ND)*
B-908	17	135.7	5.28	2.38	2.2	187	Shear	5,670	3,180,000	0.21
B-908	20	146.8	5.31	2.38	2.2	173	Shear	7,687	*(ND)*	(ND)
B-909	11	82.4	5.32	2.39	2.2	176	C&S	9,464	3,520,000	* (4)
B-909	14	96.5	5.28	2.39	2.2	190	Shear	5,897	*(ND)*	*(ND)*
B-909	17	107.4	5.35	2.39	2.2	179	Shear	3,938	*(ND)*	*(ND)*
B-909	21	127.4	5.35	2.39	2.2	174	Shear	8,167	*(ND)*	*(ND)*
B-909	26	152.3	5.27	2.38	2.2	184	C&S	6,467	4,600,000	0.39
B-909	33	187.3	5.32	2.39	2.2	175	Shear	9,305	*(ND)*	*(ND)*
B-910	5	53.1	5.27	2.15	2.2	159	Shear	6,935	*(ND)*	*(ND)*
B-910	13	91.1	5.24	2.15	2.2	159	Shear	4,821	670,000	* (4)
B-910	20	120.9	5.27	2.40	2.2	163	Columnar	9,395	*(ND)*	*(ND)*
B-910	24	142.1	5.35	2.40	2.2	168	C&S	28,834	*(ND)*	*(ND)*
B-911	3	34.3	5.27	2.37	2.2	161	Shear	5,558	1,230,000	* (4)
B-911	5	44.3	5.28	2.38	2.2	162	Cone	10,209	*(ND)*	*(ND)*
B-911	10	66.5	5.35	2.39	2.2	164	Cone	24,646	*(ND)*	*(ND)*
B-911	13	82.1	5.36	2.40	2.2	164	C&S	20,431	5,730,000	0.40

(1) Type of Breaks: Columnar; Cone (C); Shear (S); Cone & Shear (C&S)
(2) Unconfined compressive strength corrected for L/D Ratio
Compressive strength testing was performed in general accordance with ASTM D7012-04.
(3) (ND) indicates that information was not determined
(4) Value of Poisson's ratio is greater than 0.5 which indicates inelastic behavior probably due to presence of fractures or discontinuities affecting lateral strain

Prepared By [signature]
Checked By [signature]

TABLE 4
LABORATORY TEST RESULTS - ROCK
North Anna Power Station - COL Project
MACTEC PROJECT NO. 6468-06-1472

Boring No.	Run Number	Sample Top Depth (ft)	Sample Length (L) (Inches)	Sample Diameter (D) (inches)	L/D Ratio	Unit Weight (pcf)	Type of Break (1)	Unconfined Compressive Strength (psi)(2)	Young's Modulus (psi) (psi)	Poisson's Ratio
B-911	16	97.6	5.36	2.40	2.2	163	Shear	6,561	*(ND)* 3	*(ND)*
B-912	3	37.1	5.32	2.39	2.2	170	C&S	3,524	2,570,000	*(ND)*
B-912	5	48.9	5.26	2.40	2.2	163	C&S	12,992	*(ND)*	*(ND)*
B-912	8	62.2	5.26	2.40	2.2	164	C&S	32,680	*(ND)*	*(ND)*
B-912	12	82.4	5.25	2.40	2.2	163	Shear	27,356	*(ND)*	*(ND)*
B-912	17	111.4	5.32	2.40	2.2	163	Shear	16,702	8,220,000	0.31
B-912	24	143.9	5.26	2.40	2.2	161	Columnar	15,996	*(ND)*	*(ND)*
B-914	8	63.8	5.34	2.40	2.2	169	Cone	17,866	*(ND)*	*(ND)*
B-914	10	75.3	5.32	2.40	2.2	164	C&S	36,600	*(ND)*	*(ND)*
B-914	15	95.8	5.37	2.40	2.2	164	C&S	29,776	8,980,000	0.31
B-914	20	120.6	5.32	2.39	2.2	169	C&S	17,942	*(ND)*	*(ND)*
B-914	26	151.4	5.31	2.40	2.2	166	C&S	16,517	8,930,000	0.32
B-914	34	192.7	5.32	2.40	2.2	163	Cone	30,162	*(ND)*	*(ND)*
B-918	2	31.7	5.29	2.39	2.2	164	Shear	19,038	*(ND)*	*(ND)*
B-918	4	37.1	5.32	2.40	2.2	164	C&S	29,636	9,530,000	0.35
B-918	7	51.6	5.29	2.40	2.2	165	Cone	15,409	*(ND)*	*(ND)*
B-918	9	60.7	5.32	2.40	2.2	164	Columnar	21,064	*(ND)*	*(ND)*
B-918	15	88.1	5.28	2.40	2.2	165	Shear	21,944	7,850,000	0.24
B-918	22	122.0	5.25	2.40	2.2	166	C&S	33,610	*(ND)*	*(ND)*
B-920	7	90.2	5.28	2.39	2.2	160	Shear	1,021	*(ND)*	*(ND)*

(1) Type of Breaks: Columnar; Cone (C); Shear (S); Cone & Shear (C&S)
(2) Unconfined compressive strength corrected for L/D Ratio
Compressive strength testing was performed in general accordance with ASTM D7012-04.
(3) (ND) indicates that information was not determined

Prepared By JBZ
Checked By SSC

TABLE 4
LABORATORY TEST RESULTS - ROCK
North Anna Power Station - COL Project
MACTEC PROJECT NO. 6468-06-1472

Boring No.	Run Number	Sample Top Depth (ft)	Sample Length (L) (Inches)	Sample Diameter (D) (inches)	L/D Ratio	Unit Weight (pcf)	Type of Break (1)	Unconfined Compressive Strength (psi)(2)	Young's Modulus (psi) (psi)	Poisson's Ratio
B-920	11	107.7	5.32	2.39	2.2	163	Cone	29,621	8,500,000	0.34
B-920	13	119.1	5.33	2.39	2.2	181	Shear	9,456	*(ND)*	*(ND)*
B-920	18	141.1	5.35	2.40	2.2	166	Cone	18,040	5,970,000	* (4)
B-923	6	20.0	5.35	2.39	2.2	164	C&S	28,911	8,510,000	0.28
B-923	9	30.8	5.35	2.39	2.2	162	C&S	26,779	*(ND)*	*(ND)*
B-923	12	45.7	5.33	2.39	2.2	163	Shear	13,477	*(ND)*	*(ND)*
B-923	16	65.7	5.35	2.39	2.2	164	Cone	21,069	7,150,000	0.29
B-924	1	21.7	5.33	2.39	2.2	162	Shear	10,588	*(ND)* 3	*(ND)*
B-924	3	30.2	5.35	2.39	2.2	163	C&S	15,110	*(ND)*	*(ND)*
B-924	6	44.0	5.33	2.39	2.2	174	Shear	6,384	2,620,000	* (4)
B-924	12	75.1	5.33	2.40	2.2	179	C&S	5,681	*(ND)*	*(ND)*
B-927	2	43.0	5.35	2.39	2.2	163	C&S	19,288	*(ND)*	*(ND)*
B-927	6	51.6	5.35	2.39	2.2	163	C&S	27,239	6,550,000	0.49
B-927	13	74.9	5.33	2.39	2.2	164	Cone	30,297	*(ND)*	*(ND)*
B-927	18	96.3	5.35	2.39	2.2	164	C&S	28,266	*(ND)*	*(ND)*
B-928	2	52.6	5.33	2.39	2.2	153	Shear	1,318	*(ND)*	*(ND)*
B-928	6	74.7	5.35	2.39	2.2	162	Cone	20,333	5,070,000	0.35
B-933	3	50.5	5.33	2.39	2.2	163	Cone	19,395	*(ND)*	*(ND)*
B-933	7	66.6	5.34	2.38	2.2	162	Columnar	15,764	8,600,000	* (4)
B-933	11	90.1	5.32	2.39	2.2	164	Cone	30,993	*(ND)*	*(ND)*
B-948	6	56.8	5.28	2.39	2.2	162	C&S	17,089	*(ND)*	*(ND)*
B-948	10	76.1	5.25	2.40	2.2	167	C&S	22,435	*(ND)*	*(ND)*

(1) Type of Breaks: Columnar; Cone (C); Shear (S); Cone & Shear (C&S)
(2) Unconfined compressive strength corrected for L/D Ratio
Compressive strength testing was performed in general accordance with ASTM D7012-04.
(3) (ND) indicates that information was not determined
(4) Value of Poisson's ratio is greater than 0.5 which indicates inelastic behavior probably due to presence of fractures or discontinuities affecting lateral strain

Table 5
SUMMARY OF PACKER TEST RESULTS
NORTH ANNA COL
MACTEC ENGINEERING AND CONSULTING, INC.
PROJECT # 6468-06-1472

Boring	Ground Elevation, ft	Depth Interval (below ground) Tested, ft	Elevation middle of test interval, ft	Ke, ft/yr (1)	Notes
B-901	309.42	77-87	227.42	0	No flow at any test pressure
		92-102	212.42	NA	Flow significantly different at low range and at maximum test pressures. Ke at maximum test pressure (average of 2 tests) is 150.4 ft/yr. Ke at low range of test pressures (average of 2 tests is 12.3 ft'yr.
		107-117	197.42	NA	Flow only at maximum test pressure. Ke at maximum test pressure (average of 2 tests) is 114.8 ft/yr
		118-128	186.42	NA	Flow significantly different at low range and at maximum test pressures. Ke at low pressure range (average of 2 tests) = 19.8 ft/yr Ke at maximum pressure (average of 2 tests) = 73.8 ft/yr.
		145-155	159.42	0	No flow at any test pressure; suspected pump capacity problem.
		145-155	159.42	NA	Second test using different pump. Flow only at maximum pressure. Ke (average of two tests) = 25.7 ft/yr.
B-949	334.82	84-89	248.32	173.5	
		89-94	243.32	NA	Flow only at maximum test pressure. Ke at maximum test pressure (average of 2 tests) is 48.4 ft/yr
		94.5-99.5	237.82	2293.2	
B-950	282.5	55-60	225	0	No flow at any test pressure
		60-65	220	0	No flow at any test pressure
		82-87	198	0	Only initial flow then none; no sustained flow, no Ke calculated.
B-951	249.93	71-76	176.43	0	Only initial flow then none; no sustained flow, no Ke calculated.
		78-83	169.43	0	Only initial flow then none; no sustained flow, no Ke calculated.

(1) Ke in this column is reported only if flow occurred at all test pressures and a linear plot of flow versus pressure resulted. See comments for Ke values at different pressures .

Prepared By/Date, [signature] 1-19-07
Checked By/Date, SJZ

Table 6
Summary of Slug-Test Results (ASTM D 4044-96(02))
North Anna COL
MACTEC Engineering and Consulting, Inc.
MACTEC Project No. 6468-06-1472

Well ID	Top of Casing Elevation (feet)	Elevation of Screened Interval (feet)	Slug Test ID	Date Test Conducted	Hydraulic Conductivity (ft/day)	Hydraulic Conductivity (cm/sec)	Comments
OW-945	283.08	239.58 -229.58	OW-945-in	11/13/2006	2.8	$1.0x10^{-3}$	Well screened in silty fine to coarse sand (SM)
OW-945	283.08	239.58 -229.58	OW-945-in2	11/13/2006	3.3	$1.2x10^{-3}$	Well screened in silty fine to coarse sand (SM)
OW-945	283.08	239.58 -229.58	OW-945-out	11/13/2006	3.8	$1.4x10^{-3}$	Well screened in silty fine to coarse sand (SM)
OW-946	335.58	302.68 - 292.68	OW-946-in	11/14/2006	9.2	$3.2x10^{-3}$	Well screened in silty fine to coarse sand (SM)
OW-946	335.58	302.68 - 292.68	OW-946-in2	11/14/2006	7.4	$2.6x10^{-3}$	Well screened in silty fine to coarse sand (SM)
OW-946	335.58	302.68 - 292.68	OW-946-out	11/14/2006	9.9	$3.5x10^{-3}$	Well screened in silty fine to coarse sand (SM)
OW-946	335.58	302.68 - 292.68	OW-946-out2	11/14/2006	8.2	$2.9x10^{-3}$	Well screened in silty fine to coarse sand (SM)
OW-947	315.08	268.08 - 258.08	OW-947-in	11/13/2006	0.67	$2.4x10^{-4}$	Well screened in silty, fine sand (SM)
OW-947	315.08	268.08 - 258.08	OW-947-in2	11/13/2006	0.59	$2.1x10^{-4}$	Well screened in silty, fine sand (SM)
OW-947	315.08	268.08 - 258.08	OW-947-out	11/13/2006	0.46	$1.6x10^{-4}$	Well screened in silty, fine sand (SM)
OW-947	315.08	268.08 - 258.08	OW-947-out2	11/13/2006	0.54	$1.9x10^{-4}$	Well screened in silty, fine sand (SM)
OW-949	336.91	242.41 - 232.41	OW-949-in	11/14/2006	2.0	$7.0x10^{-4}$	Well screened in moderate to moderately severe weathered quartz biotite gneiss
OW-949	336.91	242.41 - 232.41	OW-949-in2	11/14/2006	1.9	$6.7x10^{-4}$	Well screened in moderate to moderately severe weathered quartz biotite gneiss
OW-949	336.91	242.41 - 232.41	OW-949-out2	11/14/2006	2.4	$8.4x10^{-4}$	Well screened in moderate to moderately severe weathered quartz biotite gneiss

Prepared by: ____________

Checked by: ____________

Table 7
Summary of Groundwater Test Results
North Anna COL
MACTEC Engineering and Consulting, Inc.
Project # 6470-06-1472

Analytical Method →		*EPA Method 300.0A [1]*						*EPA Method 353.1 [1]*	*EPA Method 350.1 [1]*	*EPA Method 310.1 [1]*	*EPA Method 160.1 [1]*
Tested Parameters →		Bromide	Chloride	Fluoride	Nitrate [2]	Nitrite[2]	Sulfate[3]	Nitrate/Nitrite as Nitrogen	Nitrogen as Ammonia	Total Alkalinity	Total Dissolved Solids
Sample ID	**Sample Date**										
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
OW-901	11/16/2006	<0.25	8.8	0.12	0.13	0.30	2.1	0.19	0.14	74.0	133
OW-945 [4]	11/17/2006	<0.25	0.93	<0.10	<0.02	<0.02	0.52	<0.05	<0.05	<5.0	11.0
OW-946	11/28/2006	<0.25	1.5	0.027 B,J	NT	NT	0.69	0.065	<0.05	22.0	64.0
OW-947[4]	11/17/2006	<0.25	1.9	0.049 B	0.92	<0.02	2.1	0.97	<0.05	25.0	72.0
OW-949	11/28/2006	<0.25	2.3	0.094 B,J	NT	NT	2.9	0.52	<0.05	38.0	93.0
OW-950	11/16/2006	<0.25	25.3	0.14	0.32	0.13	17.2	0.65	0.14	71.0	162
OW-951[4]	11/17/2006	<0.25	9.3	0.63	0.25	0.17 B	592	0.39	0.078	184	1090

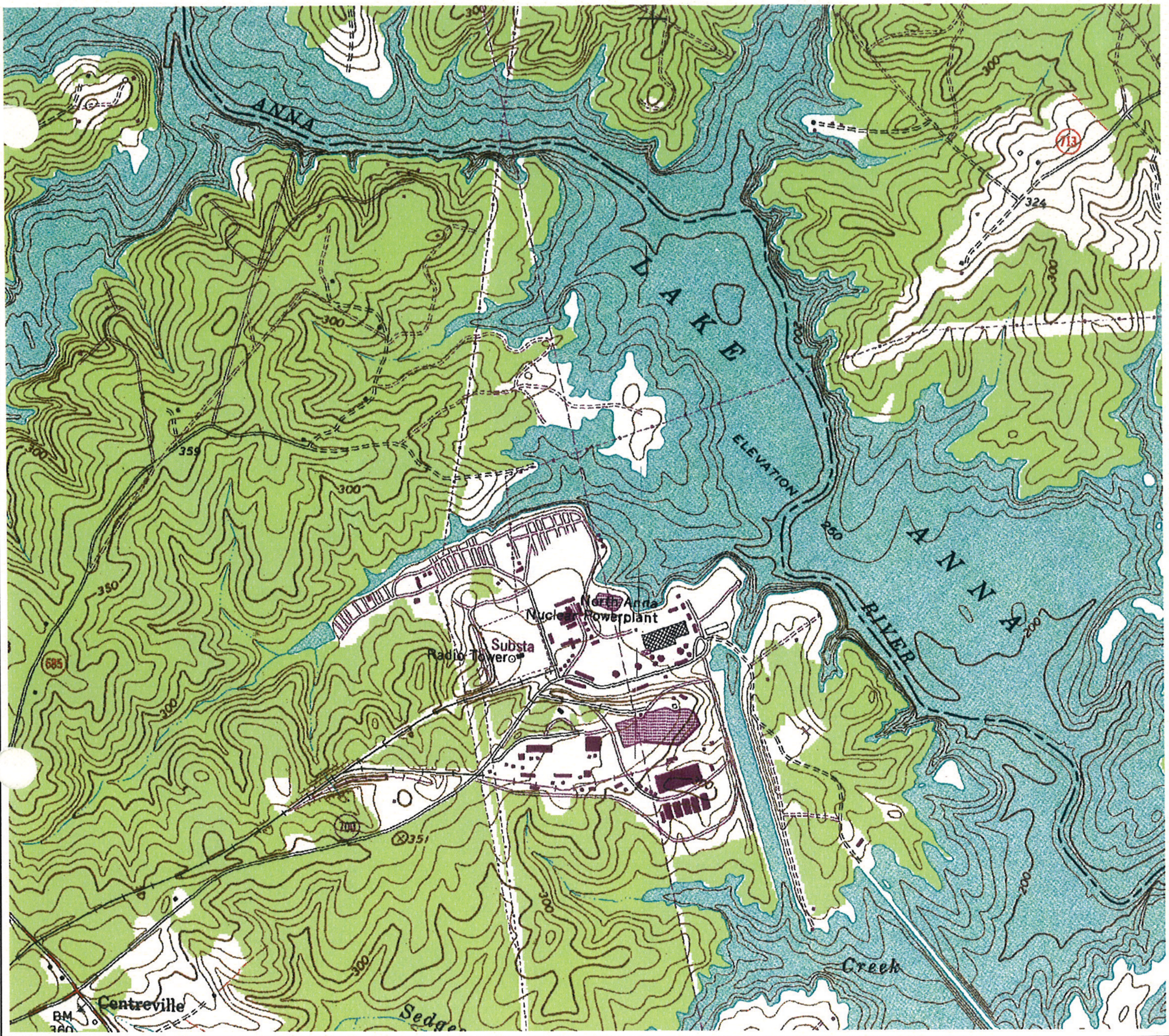
NOTES:

< *(value)* indicates analyte not detected at or above the referenced Reporting Limit (RL)
B = Estimated Result. Result is less than Reporting Limit
J = Method blank contamination. The associated method blank contains the target analyte at a reportable level
NT = Not Tested

(1) "Methods for Chemical Analysis of Water and Waste", EPA-600/4-79-020, March 1983 and subsequent revisions
(2) These tests not assigned, but were conducted on some samples by the lab in addition to the assigned Nitrate/Nitrite due to these tests having been part of a standard suite of testing.
(3) Sulfate (an assigned test) was accepted as substitute for sulfide (an originally-assigned test); see report text for further discussion.

(4) Anion tests and Nitrogen as Ammonia tests were performed either outside the recommended hold time (Anions) or using a reagent past its expiration date (Ammonia). Review of results and consultation with Dominiion and Bechtel through the non-conformance process resulted in a determination that the sample test results are acceptable "as-is". See report text for further discussion.

Prepared by: *[signature]* Date: 1-22-07
Checked by: *[signature]* Date: 1-23-07



NORTH

LAKE ANNA WEST, VA.
(FORMERLY CONTRARY CREEK)
38077-A7-TF-024

1973
PHOTOREVISED 1983
DMA 5460 III SE–SERIES V834

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

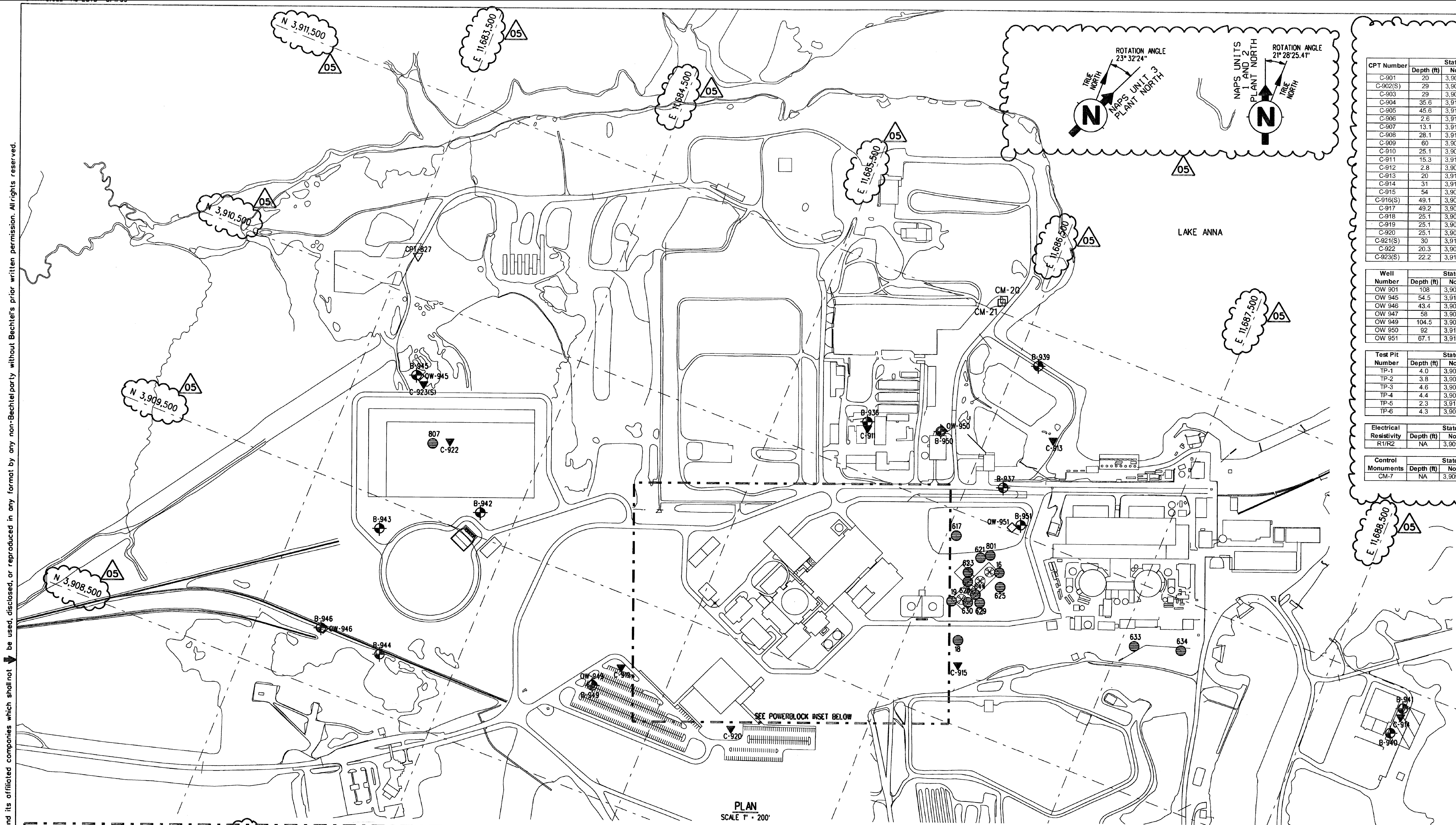
VIRGINIA
QUADRANGLE LOCATION

NOTE: SITE LOCATION IS APPROXIMATE

MACTEC
MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA

SITE VICINITY MAP
NORTH ANNA COL
MINERAL, VIRGINIA

DRAWN:	DATE: JANUARY 2007	DRAWING
ENG CHECK:	SCALE: 1" = 2000'	1
APPROVAL:	JOB: 6468-06-1472	



CPT Number	State Plane Coordinates (ft) Depth (ft)	Northing	Easting	Elevation	Location/Remarks
C-901	20	3,909,627.77	11,686,012.67	318.56	SERVICE BUILDING
C-902(S)	29	3,909,552.59	11,685,842.21	323.66	HOT MACHINE SHOP/SEISMIC CONE
C-903	29	3,909,719.02	11,685,775.66	306.84	WASH DOWN BAYS
C-904	35.6	3,910,026.29	11,685,793.52	283.92	RADWASTE BUILDING
C-905	45.6	3,910,137.61	11,685,857.21	279.29	CIRCULATING WATER PIPE
C-906	2.6	3,910,013.77	11,686,269.94	270.75	ELECTRICAL MODULES
C-907	13.1	3,910,174.67	11,686,277.14	271.66	AUXILIARY TRANSFORMER
C-908	28.1	3,910,326.76	11,686,187.39	271.91	SWITCHYARD TAKEOFF TOWER
C-909	60	3,909,346.74	11,685,717.77	330.26	ADMINISTRATION BUILDING
C-910	25.1	3,909,154.43	11,685,782.42	326.99	ADMINISTRATION BUILDING
C-911	15.3	3,910,716.79	11,685,941.76	286.69	TRANSMISSION TOWER
C-912	2.8	3,909,959.42	11,686,349.77	271.16	CLOSE TO DIESEL TANKS
C-913	20	3,910,999.95	11,686,812.54	268.65	INTAKE CHANNEL BANK
C-914	31	3,910,360.20	11,688,917.62	267.86	SIMULATOR/TRAINING BLDG EXPANSION
C-915	54	3,909,784.60	11,686,794.40	320.92	SLOPE
C-916(S)	49.1	3,909,584.68	11,686,372.70	312.91	SLOPE/SEISMIC CONE
C-917	49.2	3,909,337.29	11,686,293.79	320.37	SLOPE
C-918	25.1	3,909,151.49	11,685,509.11	329.55	PARKING LOT
C-919	25.1	3,909,154.30	11,685,255.41	338.06	PARKING LOT
C-920	25.1	3,909,071.70	11,685,870.40	324.73	PARKING LOT
C-921(S)	30	3,910,112.20	11,685,717.17	281.10	CIRCULATING WATER PIPE/SEISMIC CONE
C-922	20.3	3,909,889.28	11,684,055.95	311.73	COOLING TOWER AREA
C-923(S)	22.2	3,910,107.49	11,683,828.42	283.03	COOLING TOWER AREA/SEISMIC CONE

Well Number	State Plane Coordinates (ft) Depth (ft)	Northing	Easting	Elevation	Location/Remarks
OW 901	108	3,909,772.32	11,685,917.49	309.62	
OW 945	54.5	3,910,136.49	11,683,793.31	281.56	SLUG TEST
OW 946	43.4	3,908,787.97	11,683,822.73	334.04	SLUG TEST
OW 947	58	3,909,579.58	11,686,371.84	313.30	SLUG TEST
OW 949	104.5	3,909,025.20	11,685,153.35	335.67	SLUG TEST
OW 950	92	3,910,842.18	11,686,285.15	282.98	
OW 951	67.1	3,910,521.44	11,686,786.01	249.69	

Test Pit Number	State Plane Coordinates (ft) Depth (ft)	Northing	Easting	Elevation	Location/Remarks
TP-1	4.0	3,909,777.09	11,685,935.73	309.52	ADJACENT TO B-901
TP-2	3.8	3,909,610.00	11,685,932.34	322.18	ADJACENT TO B-907
TP-3	4.6	3,909,702.79	11,686,076.24	306.50	ADJACENT TO B-909
TP-4	4.4	3,909,887.87	11,686,109.68	299.76	ADJACENT TO B-915
TP-5	2.3	3,910,163.65	11,686,033.65	274.75	ADJACENT TO B-917
TP-6	4.3	3,909,971.90	11,685,884.07	291.98	ADJACENT TO B-927

Electrical Resistivity	State Plane Coordinates (ft) Depth (ft)	Northing	Easting	Elevation	Location/Remarks
R1/R2	NA	3,909,183.87	11,685,747.21	328.15	FIELD ELECTRICAL RESISTIVITY TEST

Control Monuments	State Plane Coordinates (ft) Depth (ft)	Northing	Easting	Elevation	Location/Remarks
CM-7	NA	3,909,874.97	11,685,943.52	303.76	POWER BLOCK

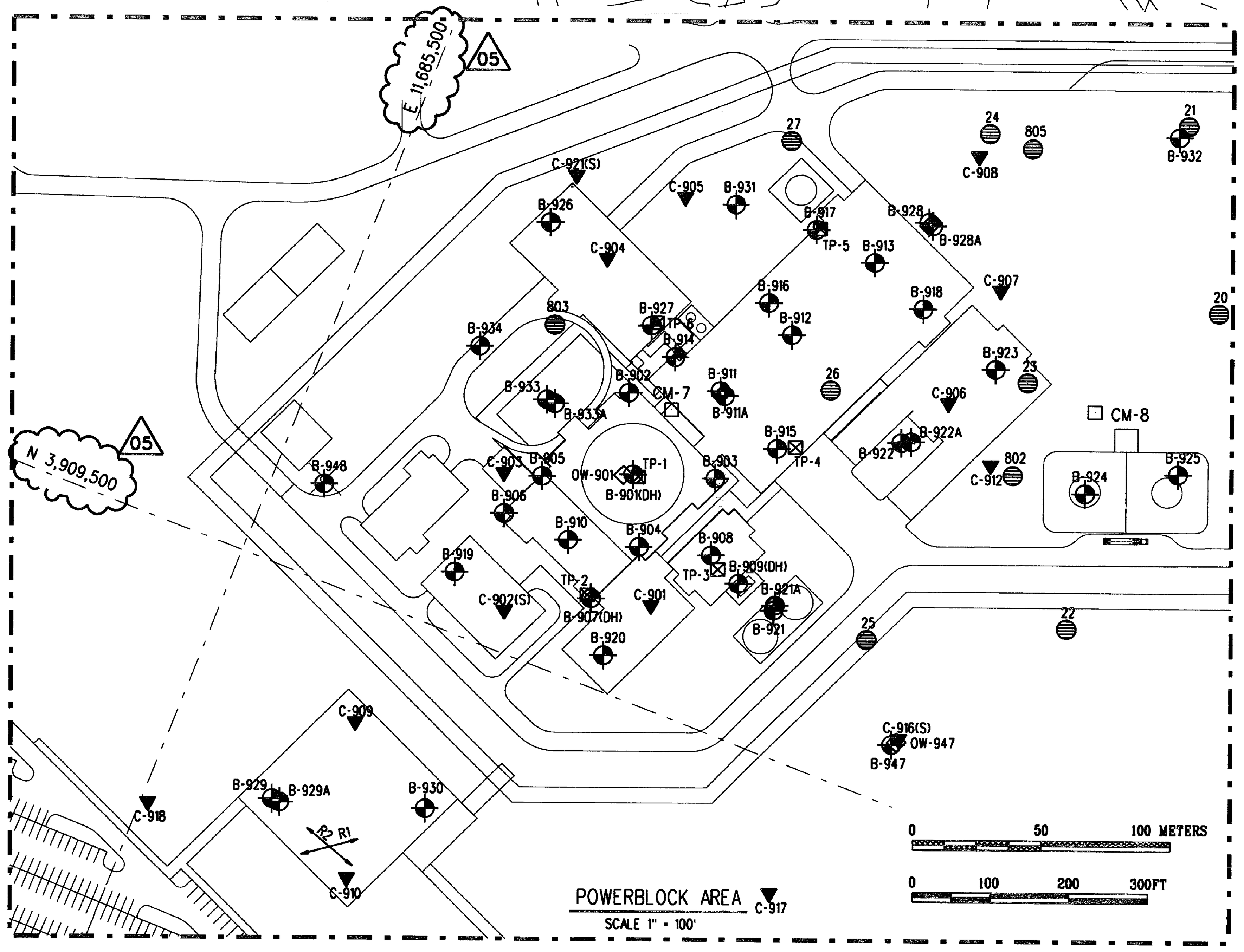
DOMINION VENDOR DRAWING STAMP

REFERENCE: DCP, PO, ET, ETC. NUMBER PO 70144375

DN APPROVAL R. S. Harnol — DATE 01/23/07

DN DRAWING NUMBER 59-0-B666-0-CY-0100-00001 — VP REV 005

SHT 1 OF 1



Boring Number	State Plane Coordinates (ft) Depth (ft)	Northing	Easting	Elevation	Location/Remarks
B-901(DH)	300	3,909,777.72	11,685,928.59	309.42	REACTOR BLDG/DOWN-HOLE GEOPHYSICAL / PACKER TEST
B-902	201.7	3,909,874.19	11,685,884.28	302.20	REACTOR BUILDING
B-903	151	3,909,812.10	11,686,028.80	301.59	REACTOR BUILDING
B-904	151.7	3,909,692.47	11,685,970.43	316.75	REACTOR BUILDING
B-905	150.4	3,909,732.86	11,685,821.97	306.75	REACTOR BUILDING
B-906	150.5	3,909,670.03	11,685,795.34	311.72	FUEL BUILDING
B-907(DH)	200.5	3,909,607.90	11,685,938.35	322.71	FUEL BLDG/DOWN-HOLE GEOPHYSICAL
B-908	151.4	3,909,716.65	11,686,060.89	307.71	CONTROL BUILDING
B-909(DH)	201.9	3,909,695.46	11,686,107.40	304.90	CONTROL BLDG//DOWN-HOLE GEOPHYSICAL
B-910	148.4	3,909,667.63	11,685,883.11	316.54	FUEL BUILDING
B-911	101	3,909,919.91	11,685,992.68	299.79	TURBINE BUILDING
B-911A	21.7	3,909,916.04	11,686,000.53	299.91	TURBINE BUILDING
B-912	151.8	3,910,021.70	11,686,051.36	275.10	TURBINE BUILDING
B-913	100.9	3,910,148.50	11,686,114.71	273.37	TURBINE BUILDING
B-914	200.5	3,909,939.55	11,685,922.35	297.45	TURBINE BUILDING
B-915	112.8	3,909,877.48	11,686,088.55	301.79	TURBINE BUILDING
B-916	100.3	3,910,049.54	11,686,008.70	276.24	TURBINE BUILDING
B-917	150.8	3,910,160.68	11,686,029.45	274.85	TURBINE BUILDING
B-918	150.1	3,910,115.28	11,686,194.05	272.13	TURBINE BUILDING
B-919	76.2	3,909,575.39	11,685,764.67	317.79	HOT MACHINE SHOP
B-920	150.7	3,909,545.07	11,685,980.20	327.17	SERVICE BUILDING
B-921	73.9	3,909,680.19	11,686,162.71	307.96	FIRE WATER TANK & PUMPS
B-921A	40.4	3,909,686.89	11,686,161.68	307.39	FIRE WATER TANK & PUMPS
B-922	26.5	3,909,943.65	11,686,232.99	271.30	ELECTRICAL MODULES
B-922A	76.5	3,909,949.30	11,686,244.02	271.33	ELECTRICAL MODULES
B-923	75.4	3,910,076.97	11,686,309.48	272.00	ELECTRICAL MODULES
B-924	75.6	3,909,969.53	11,686,475.40	271.52	DIESEL TANK
B-925	75.8	3,910,036.67	11,686,576.27	270.01	DIESEL TANK
B-926	155.5	3,910,043.20	11,685,709.26	289.03	RADWASTE BUILDING
B-927	100.4	3,909,966.07	11,685,878.59	292.51	RADWASTE BUILDING
B-928	75.2	3,910,222.75	11,686,159.07	272.17	MAIN TRANSFORMER
B-928A	37.5	3,910,220.39	11,686,165.35	271.82	MAIN TRANSFORMER
B-929	74	3,909,214.44	11,685,654.82	329.02	ADMINISTRATION BUILDING
B-929A	52.5	3,909,214.15	11,685,665.51	329.03	ADMINISTRATION BUILDING
B-930	123.6	3,909,275.95	11,685,842.87	326.12	ADMINISTRATION BUILDING
B-931	74	3,910,152.94	11,685,921.54	278.52	CONDENSATE STORAGE TANK
B-932	35.1	3,910,444.31	11,686,415.70	249.88	WATER STORAGE TANK
B-933	100.2	3,909,827.41	11,685,790.97	296.48	YARD/RADWASTE TUNNEL
B-933A	27.5	3,909,826.28	11,685,802.01	296.58	YARD/RADWASTE TUNNEL
B-934	101.6	3,909,860.37	11,685,686.09	294.80	YARD/CRANE
B-935					DELETED
B-936	100.7	3,910,745.87	11,685,929.15	286.56	TRANSMISSION TOWER
B-937	55.3	3,910,688.52	11,686,672.12	270.25	INTAKE STRUCTURE
B-938					DELETED
B-939	76.1	3,911,317.60	11,686,605.91	254.03	INTAKE STRUCTURE COFFERDAM
B-940	76.1	3,910,266.77	11,688,901.02	268.32	SIMULATOR/TRAINING BLDG EXPANSION
B-941	75.8	3,910,403.63	11,688,912.87	267.19	SIMULATOR BLDG EXPANSION
B-942	100.8	3,909,614.69	11,684,326.45	291.85	COOLING TOWER AREA
B-943	101.9	3,909,355.39	11,683,892.47	300.40	COOLING TOWER AREA
B-944	86.4	3,908,772.38	11,684,127.62	334.69	COOLING TOWER AREA
B-945	100.6	3,910,135.55	11,683,779.79	281.51	COOLING TOWER AREA
B-946	100.7	3,908,787.24	11,683,810.59	333.36	COOLING TOWER AREA
B-947	88.8	3,909,574.53	11,686,367.21	312.48	SLOPE
B-948	100.6	3,909,619.26	11,685,565.69	310.41	STACK
B-949	106.4	3,909,018.09	11,685,157.27	334.82	ADJACENT TO OW-949 / PACKER TEST
B-950	100.8	3,910,835.82	11,686,282.11	282.50	ADJACENT TO OW-950 / PACKER TEST
B-951	101	3,910,548.26	11,686,821.80	249.93	ADJACENT TO OW-951 / PACKER TEST

REFERENCES:

0-P1-0010-00001 REV OE PLOT PLAN

NOTES:

1. COORDINATES ARE IN NAD83 VIRGINIA SOUTH STATE PLANE GRID (US FEET).
2. ELEVATIONS ARE IN NAVD 88 (US FEET).
3. EXISTING SURVEY DATA PROVIDED BY CLIENT.

LEGEND

- B-801 EXISTING BORING
- B-917 UNIT 3 BORING
- B-901(DH) UNIT 3 BORING WITH DOWN-HOLE GEOPHYSICAL MEASUREMENTS
- OW-901 UNIT 3 OBSERVATION WELL
- CPT-827 EXISTING CPT
- C-915 UNIT 3 CPT
- C-916(S) UNIT 3 CPT WITH SEISMIC TESTING
- UNIT 3 R-1 FIELD ELECTRICAL RESISTIVITY TEST
- CONTROL MONUMENT
- UNIT 3 TEST PIT

SAFETY RELATED

0 100 200 METERS

0 200 400 600FT

NO.	DATE	REVISIONS	BY	CHK	DES SUPV.	ENGR.	PROJ ENGR	APPR
5	1/23/07	AS-BUILT BORING LOCATIONS	[signature]	[signature]		[signature]	[signature]	
4	07/28/06	DELETED B-935, MOVED B-942, B-943, B-944, B-946, & OW-946	VJD	JRD	-	JLM	RLB	
3	07/28/06	REVISED COORDINATES	VJD	JRD	-	JLM	RLB	
2	07/26/06	REV'D STATE COORDINATES TO NAD83 VIRGINIA SOUTH STATE PLANE	RW	JRD	-	WBH	RLB	
1	07/24/06	ADDED STATE COORDINATES	RW	JRD	-	WBH	RLB	
0	06/30/06	ISSUED FOR USE		JRD	-	WBH	RLB	

SCALE AS NOTED — DATE 02/09/06 — DESIGNED — DRAWN PWH — CHIEF ENGR.

BECHTEL
FREDERICK, MARYLAND

DOMINION
NORTH ANNA UNIT NO. 3

UNIT 3 BORING LOCATION PLAN

JOB NO.	DRAWING NO.	REV.
25161	0-CY-0100-00001	05