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33313

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#### STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

### STRUCTURE SUBSURFACE INVESTIGATION

| ROJ. R | EFERENC  | E NO    | 33313.1.1 | B-3868 |      | F. | A. PR | OJ. <b>BR</b> 2 | Z-1456(6) |  |
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#### CAUTION NOTICE

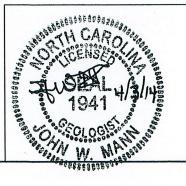
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARROUS FIELD BORNG LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1999 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORNING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BORGHOUL. THE LABORATORY SAMPLE DATA AND THE IN SITU IN-PLACE) TEST DATA CAN BE RELED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STRANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERRABLY WITH TIME ACCORDING TO CLUMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS. ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION DURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCIMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR CURRANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTICATION MADE, NOR THE INVERTRETATIONS AMDE, OR OPINON OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS BE DEEMS ENCESSARY TO SATISFY HUMBELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS TO BE CONTRACTOR OF THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

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PERSONNEL



DRAWN BY: J.W. MANN

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS
FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE
CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

### PROJECT REFERENCE NO. SHEET NO. 33313.I.I B-3868 2 OF 15

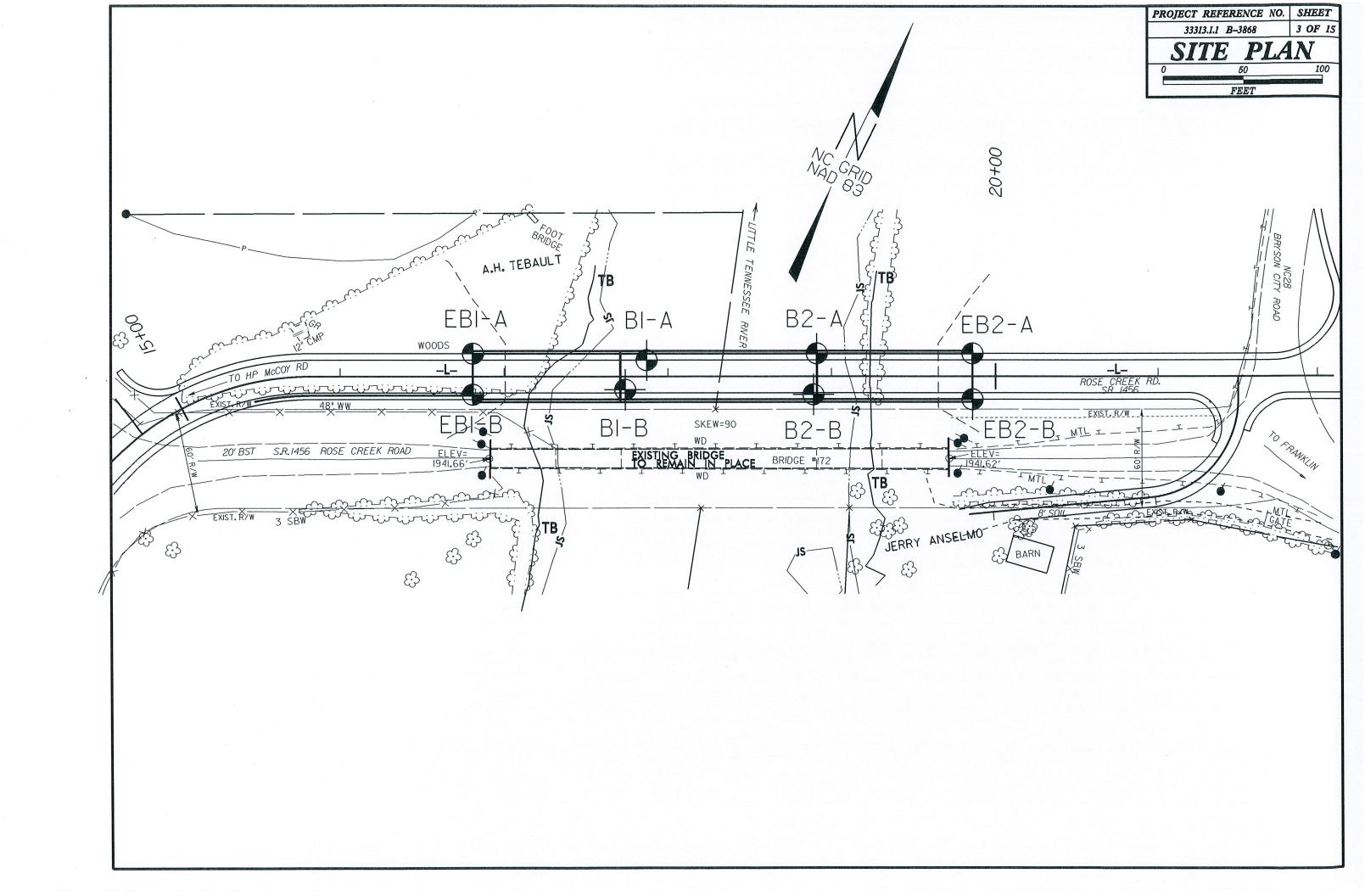
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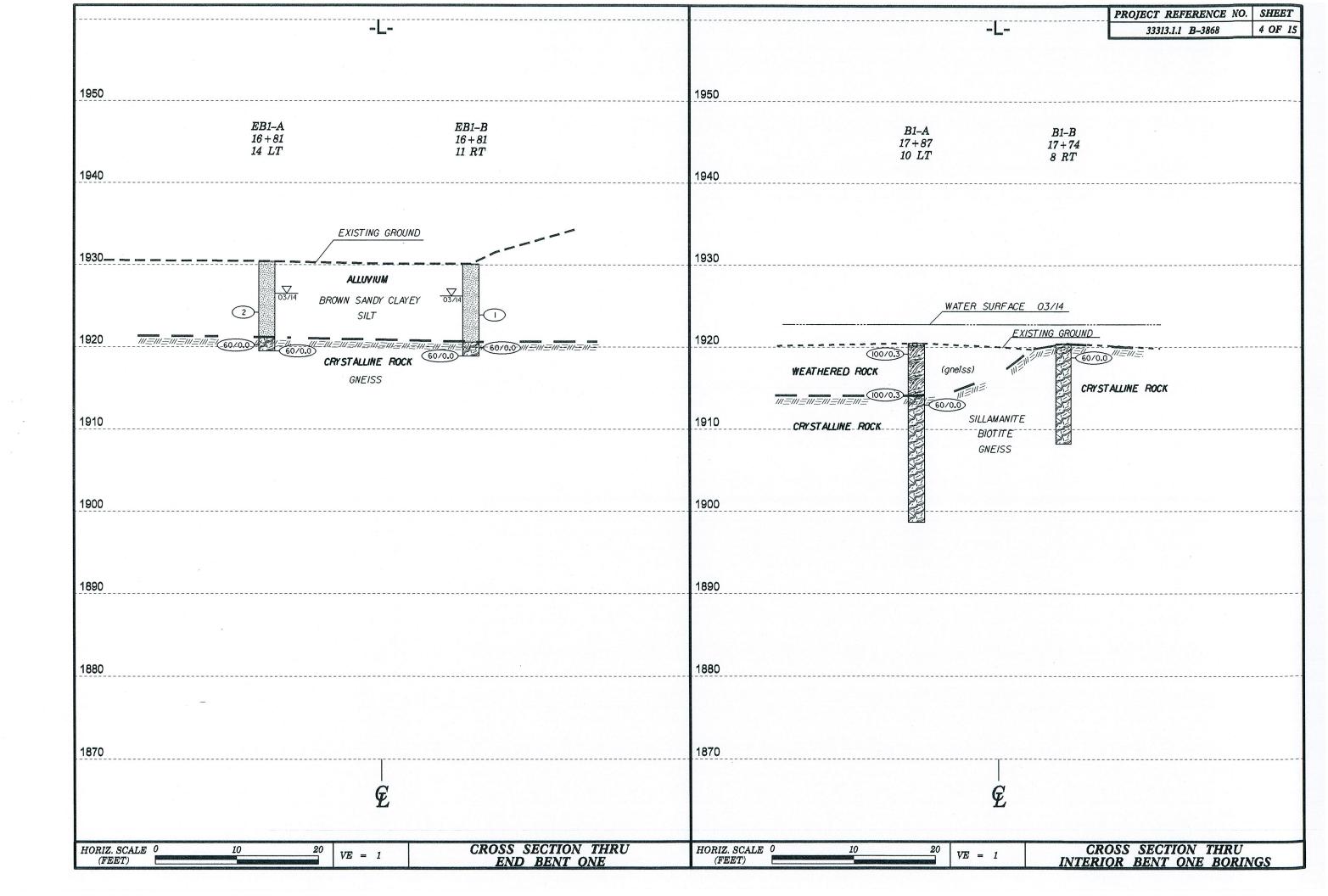
#### DIVISION OF HIGHWAYS

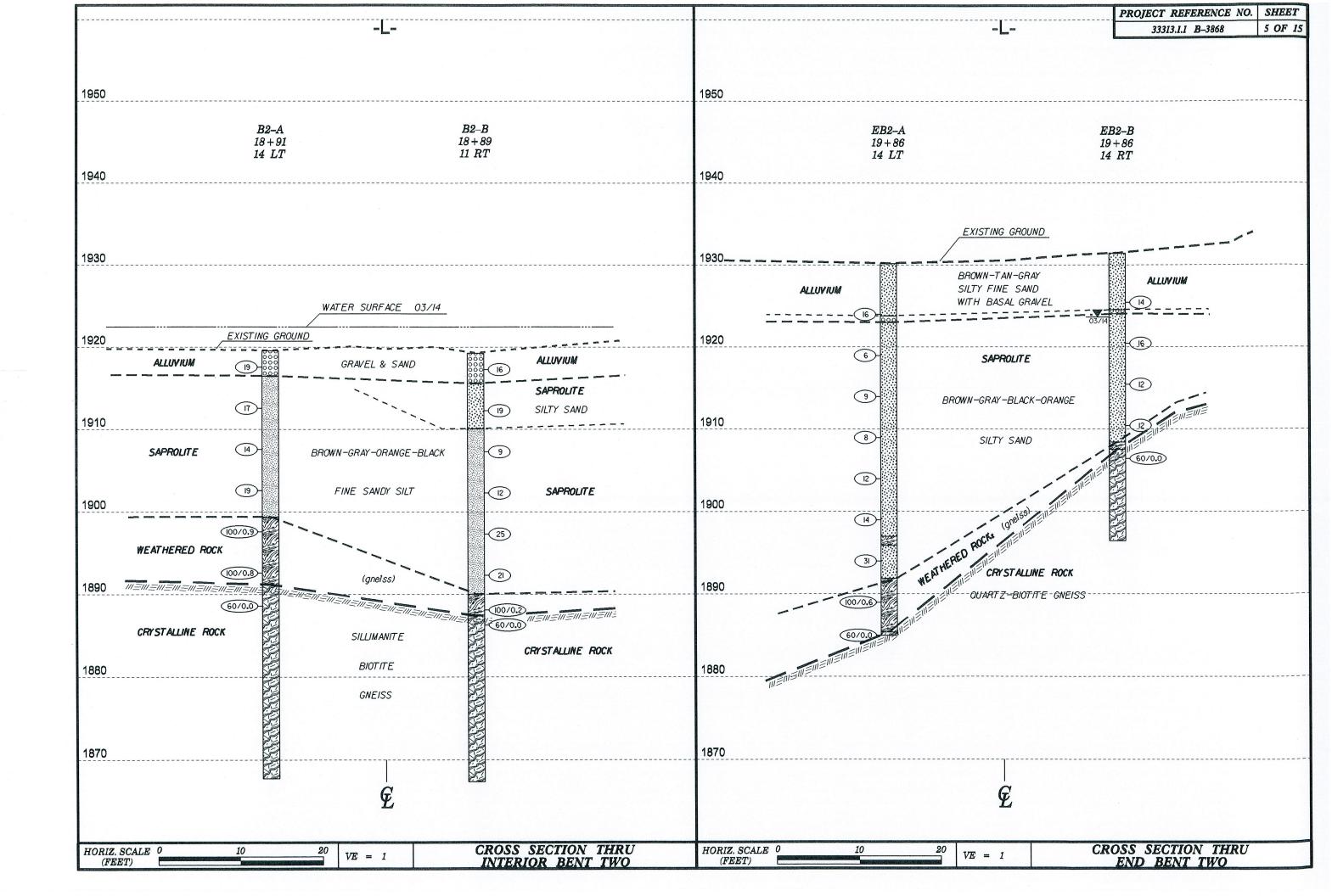
GEOTECHNICAL ENGINEERING UNIT

### SUBSURFACE INVESTIGATION

|  | SOIL AND ROCK LEGEND, TERM  | S, SYMBOLS, AND ABBREVIATIONS  |   |
|--|---|--|---|
| SOIL DESCRIPTION   | GRADATION   | ROCK DESCRIPTION   | TERMS AND DEFINITIONS   |
| SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS   | WELL GRADED - INDICATES A GODO REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO | HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL.              | ALLUVIUM (ALLUV,) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.  |
| THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586), SOIL  | POORLY GRADED)  GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.   | SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.  IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE | ADUJEER - A WATER BEARING FORMATION OR STRATA.  |
| CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH   | ANGULARITY OF GRAINS  | OF WEATHERED ROCK.  ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:   | ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.  |
| AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:   | THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBROUNDED, OR ROUNDED.   | WEATHERED WISHOUT NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100   | ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.                     |
| VERY STAT, GRAV, SUTV CLA, MOST WITH WITERBEDGED FARE SAMD LARRS, MISMLY PLASTIC, A-7-6  | MINERALOGICAL COMPOSITION   | ROCK (WR) BLOWS PER FOOT IF TESTED.  | ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE                   |
| SOIL LEGEND AND AASHTO CLASSIFICATION  GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS OPERAND MATERIALS  | MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS   | CRYSTALLINE ROCK (CR)  FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,   | GROUND SURFACE.   |
| CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) UNGANIC MATERIALS   | WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.   | GNEISS, GABBRO, SCHIST, ETC.   | CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.   |
| GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-3 A-6, A-7  | COMPRESSIBILITY   | NON-CRYSTALLINE ROCK (NCR)  FIRE TO CORRESE ORAIN THE HARDWITH AND MON-CURSTAL PLAIN SEDIMENTARY ROCK THAT WOULD YELLD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE SLATE, SANDSTONE, ETC.     | COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.   |
| CLASS. A-1   A-1-b   A-2-4   A-2-5   A-2-6   A-2-7   A-7-5   A-7   SYMBOL B00000000000000000000000000000000000   | SLIGHTLY COMPRESSIBLE LIOUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIOUID LIMIT EQUAL TO 31-50   | COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD  | CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL   |
| y passing  | HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50  PERCENTAGE OF MATERIAL  | SEDIMENTARY ROCK SPT REFUSAL, ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.   | LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.   |
| " 10   S8 MX   GRANULAR   GRANULAR   CLAY   MUCK   | ORGANIC MATERIAL GRANULAR SILT - CLAY   | WEATHERING   | DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.  |
| " 40 38 MX 58 MX 51 MN   | TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%   | FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.  | DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.   |
| L100,10 LIMIT 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN SOILS WITH   | LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35%  | VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,   | DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF   |
| PLASTIC INDEX 6 MX NP 10 MX 10 MX 11 MN 10 MX 10 MX 11 MN 11 MN LITTLE OR HIGHLY   | HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE   | (V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.  | THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.   |
| GROUP INDEX 8 8 8 4 HX 8 HX 12 HX 16 MX No HX MODERATE AMOUNTS OF SOILS  |   | SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO  | FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.  |
| OF MAJOR GRAVEL, AND GRAVEL AND GRAVEL AND SAND SOILS SOILS MATTER   | WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING  STATIC WATER LEVEL AFTER 24 HOURS  | (SLI,) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.                                | FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.   |
| MATERIALS SANU   | ——————————————————————————————————————  | MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND MEATHERING EFFECTS. IN  GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS                               | FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM   |
| AS A EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITAL SUBGRADE   |   | DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED   | PARENT MATERIAL.  FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY   |
| P1 OF A-7-5 SUBGROUP IS ≤ LL - 30 ; P1 OF A-7-6 SUBGROUP IS > LL - 30  | → O-MING OR SEEP  | WITH FRESH ROCK.  MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL  | THE STREAM.   |
| CONSISTENCY OR DENSENESS   | MISCELLANEOUS SYMBOLS   | SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION, ROCK SHOWS SEVERE LOSS OF STRENGTH  | FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.  |
| PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTENCE COMPRESSIVE STRENGTH   | ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION WITH SOIL DESCRIPTION WITH SOIL DESCRIPTION W/ CORE   | (MOD, SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK.  IF TESTED, WOULD YIELD SPT REFUSAL  | JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.  |
| VERY LONGE   | ALIOSE COORDS CONT. IL MAINTE   | SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL, IN GRANITOID ROCKS ALL FELDSPARS ARE KAQLINIZED TO SOME                    | LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO   |
| GRANIII AR LOOSE 4 TO 10   | SOIL STIMBOL  | EXTENT, SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.  | ITS LATERAL EXTENT.   |
| MATERIAL   MEDIUM DENSE   10 TO 30   17 H  | ARTIFICIAL FILL (AF) OTHER ————————————————————————————————————   | IF TESTED, VIELDS SPT N VALUES > 100 BPF  VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT   | LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.  MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN                            |
| VERY DENSE >50   | INFERRED SOIL BOUNDARY MONITORING WELL  | (V SEV.) THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH DNLY FRAGMENTS OF STRONG ROCK  | SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.  PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN                        |
| VERY SDFT         <2         <0,25           GENERALLY         SDFT         2 TO 4         0,25 TO 0,50  | TIETTE INFERRED ROCK LINE PIEZOMETER  | REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BPF                          | INTERVENING IMPERVIOUS STRATUM.   |
| SILT-CLAY   MEDIUM STIFF   4 TO 8   0.5 TO 1.0   MATERIAL   STIFF   8 TO 15   1 TO 2   | INSTALLATION  | COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND   | RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.  |
| (COHESIVE) VERY STIFF 15 TO 30 2 TO 4  | INSTALLATION  | SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS ALSO AN EXAMPLE.   | ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND |
| TEXTURE OR GRAIN SIZE  | 25/025 DIP & DIP DIRECTION OF  ROCK STRUCTURES  CONE PENETROMETER TEST  | ROCK HARDNESS  | EXPRESSED AS A PERCENTAGE.  |
|  | SOUNDING ROD  | VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES  | SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.   |
| U.S. STD. SIEVE SIZE 4 10 40 60 200 270 OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053   | -   | SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.  HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED   | SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND   |
| BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY  | ABBREVIATIONS  AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST  | TO DETACH HAND SPECIMEN.   | RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.  |
| (BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)  | BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED   | MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE HARD  EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED                        | SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR   |
| GRAIN MM 305 75 2.0 0.25 0.05 0.005  | CL CLAY MOD MODERATELY $\gamma$ - UNIT WEIGHT CPT - CONE PENETRATION TEST NP - NON PLASTIC $\gamma_6$ - DRY UNIT WEIGHT   | BY MODERATE BLOWS.   | SLIP PLANE.  STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF   |
| SIZE IN. 12 3  | CSE COARSE ORG ORGANIC  DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS  | MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.  HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE                   | A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH   |
| SOIL MOISTURE - CORRELATION OF TERMS  SOIL MOISTURE SCALE FIELD MOISTURE CHIEF OF FIELD MOISTURE OF FI | DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK  | POINT OF A GEOLOGIST'S PICK.   | A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.  |
| (ATTERBERG LIMITS)  OBSCRIPTION  GUIDE FOR FIELD MOISTURE DESCRIPTION  | F - FINE SL SILT, SILTY ST - SHELBY TUBE  | SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN                             | STRATA CORE RECOVERY ISREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.  |
| - SATURATED - USUALLY LIQUID; VERY WET, USUALLY (SAT.) FROM BELOW THE GROUND WATER TABL  | FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL   | PIECES CAN BE BROKEN BY FINGER PRESSURE.  VERY  CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH   | STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK DUALITY DESCRIBED BY   |
| LL LIOUID LIMIT  | FRAGS FRAGMENTS   | SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY  | TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.                               |
| PLASTIC   SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE  | EQUIPMENT USED ON SUBJECT PROJECT   | FINGERNAIL. FRACTURE SPACING BEDDING   | <u>IOPSOIL (TS.)</u> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.   |
| (PI) PL PLASTIC LIMIT ATTAIN OPTIMUM MOISTURE  | HANNED TYPE   | TERM SPACING TERM THICKNESS  | BENCH MARK: BM #1: RAILROAD SPIKE SET IN 8" BIRCH TREE  |
| OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTUR  | E X AUTOMATIC MANUAL  | VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED > 4 FEET WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET   | -BL- STATION 13+57.38 28.89' RT   |
| SL SHRINKAGE LIMIT   | MOBILE B- CLAY BITS   | MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET VERY THINLY BEDDED 0.26 - 8.16 FEFT   | ELEVATION: 1930.33 FT.  |
| REQUIRES ADDITIONAL WATER TO - DRY - (D) ATTAIN OPTIMUM MOISTURE   | 6 CONTINUOUS FLIGHT AUGER CORE SIZE:  | CLOSE 0.16 TO 1 FEET THINK! 1 BEDDED 0.008 - 0.03 FEET VERY CLOSE LESS THAN 0.16 FEET THINK! LAMINATED < 0.008 FEET C.008 FEET   | NOTES:  |
|  | O HOLLOW HODERS   | INDURATION   |   |
| PLASTICITY PLASTICITY INDEX (PI) DRY STRENGTH  |   | FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.  |   |
| NONPLASTIC 0-5 VERY LOW  | X CME-550 TUNG,-CARBIDE INSERTS -H  | FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS;   |   |
| LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM  | CASING A WY AUVANCER HAND TOOLS:  | GENILE BLOW BY HAMMER DISINIEGRATES SAMPLE.  |   |
| HIGH PLASTICITY 26 OR MORE HIGH  | PORTABLE HOIST TRICONE STEEL TEETH POST HOLE DIGGER   | MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.   |   |
| COLOR  | TRICONE TUNG,-CARB, HAND AUGER  TOURS DAY  SOUNDING ROD   | INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE;   |   |
| DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).  | X CORE BIT SOUNDING ROD VANE SHEAR TEST   | DIFFICULT TO BREAK WITH HAMMER.  FXTBEMELY INDUBATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;  |   |
| MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.   |   | EXTREMELY INDURATED SHAPP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.  |   |







SHEET

| <b>NBS</b> | 33313        | 3.1.1  |        |        | Т      | IP.  | B-3868               | COUNT   | Y MACON          |          |          |          | GEOLOGIST Elliott, D                                       | . C.                             |                     |           |
|------------|--------------|--------|--------|--------|--------|------|----------------------|---------|------------------|----------|----------|----------|--|----------------------------------|---------------------|-----------|
| SITE       | DESCR        | IPTIO  | N Brid | lge No | . 172  | on   | SR 1456 (Rose Cre    | ek Road | d) over Little   | Tennes   | see R    | iver     |  |                                  | GROUN               | D WTR (f  |
| 3OR        | ING NO       | EB1    | -A     |        | S      | TA   | TION 16+81           |         | OFFSET           | 14 ft LT |          |          | ALIGNMENT -L-  |                                  | 0 HR.               | 3.        |
| COL        | LAR ELI      | EV. 1  | ,930.4 | ft     | Т      | OT   | AL DEPTH 10.9 ft     |         | NORTHING         | 583,5    | 591      |          | <b>EASTING</b> 674,913                                     |                                  | 24 HR.              | FIA       |
| RILI       | . RIG/HAI    | MMER E | FF./DA | TE AF  | FO0070 | ) CN | ME-550X 81% 09/03/20 | 09      |                  | DRILL !  | METHO    | D N      | W Casing w/ SPT  | HAMME                            | R TYPE              | Automatic |
|            | LER C        |        |        |        |        |      | RT DATE 03/12/14     |         | COMP. DA         |          |          |          | SURFACE WATER DEF  |                                  |                     |           |
| LEV        | DRIVE        | DEPTH  |        | W CO   |        | TT   | BLOWS P              |         |                  | SAMP.    |          | 1        |  |                                  |                     |           |
| (ft)       | ELEV<br>(ft) | (ft)   | 0,5ft  |        | T      | 10   |                      |         | 75 100           | NO.      | мог      | 0        | SOIL AND RO  | CK DESC                          | RIPTION             | DEPTH     |
| 935        | -            |        |        |        |        |      |                      |         |                  |          |          |          |  |                                  |                     |           |
| 930        | _            | _      | ļ      |        |        | Ц    | <u></u>              |         |                  |          |          | 22350000 |  | D SURFA                          | CE                  |           |
| 925        | 1,925.2      | 5.2    | 1      | 1      | - 1    |      | 92                   |         | ,                |          | $\nabla$ |          | AL<br>- Brown sar<br>-<br>-<br>-<br>-<br>-<br>-<br>1,921.2 | LUVIAL<br>ady clayey             | SILT                |           |
| 920        | 1:978.3      | 18.8   | 60/0.0 |        |        |      | ·                    |         |                  |          |          |          | CRYSTA   | LLINE RO                         | CK                  | 1         |
|            |              | -      | 60/0.0 |        |        |      |                      |         | 60/0.0<br>60/0.0 |          |          |          | Boring Terminated Crystalline                              | NEISS<br>at Elevatio<br>Rock: GN | on 1,919.5<br>NEISS |           |
|            |              |        |        |        |        |      |                      |         |                  |          |          |          |  |                                  |                     |           |
|            |              |        |        |        |        |      |                      |         |                  |          |          |          |  |                                  |                     |           |



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|       | 33313.1                                 | 1.1           |                  |       | T            | P B                                   | -3868       | 3        |                 | COUN                       | TY | MACON  | V   |              |          |             | GEOLOGIST Elliott, D. C.                      |                          |             |
|-------|---|---------------|------------------|-------|--------------|---------------------------------------|-------------|----------|-----------------|----------------------------|----|--------|-----|--------------|----------|-------------|---|--------------------------|-------------|
| SITE  | DESCRIP                                 | MOIT          | l Brid           | ge No |              |                                       |             |          | se Cr           |                            |    |        |     | ennes        | see R    | iver        |   | GROUN                    | ID WTR (ft) |
|       | ING NO.                                 |               |                  |       |              |                                       | ON 1        |          |                 |                            |    | FFSET  |     |              |          |             | ALIGNMENT -L-                                 | 0 HR.                    | 3.9         |
| COLL  | AR ELEV                                 | <i>1</i> . 1, | 930.1            | ft    | T            | OTAL                                  | DEP         | TH       | 11.2 ft         | distribution of            | N  | ORTHIN | IG  | 583,5        | 68       |             | <b>EASTING</b> 674,924                        | 24 HR.                   | FIAD        |
| DRILL | RIG/HAMI                                | IER E         | FF./DA           | TE A  | FO0070       | CME-                                  | 550X 8      | 81% C    | 09/03/20        | 009                        |    |        |     | ORILL N      | 1ETHO    | D N         | W Casing w/ SPT HA                            | MMER TYPE                | Automatic   |
| DRIL  | LER Che                                 | ek, [         | 0. 0.            |       | S            | TART                                  | DAT         | E 03     | 3/12/1          | 4                          | C  | OMP. D | ATE | = 03/        | 12/14    |             | SURFACE WATER DEPTH                           | N/A                      |             |
| (ft)  | DRIVE<br>ELEV<br>(ft)                   | EPTH<br>(ft)  | BLC<br>0.5ft     | 0.5ft | UNT<br>0.5ft | 0                                     |             | BL<br>25 |                 | PER FOC                    | 75 | 100    |     | SAMP.<br>NO. | MOI      | L<br>O<br>G | SOIL AND ROCK D                               | ESCRIPTION               | DEPTH (fi   |
| 1935  |   |               |                  |       |              |                                       |             |          |                 |                            |    |        |     |              |          |             |   |                          |             |
| 1930  | -                                       |               |                  |       |              |                                       |             | -        | ALCO MANAGEMENT | <del>January Cons</del> ta |    |        |     |              |          | **********  | 1,930.1 GROUND SU                             |                          | 0.          |
| 1925  | 1,924.9                                 | 5.2           | WOH              | WOH   | 1            | · · · · · · · · · · · · · · · · · · · |             |          |                 |                            |    |        | -   |              | $\nabla$ |             | ALLUVIA Brown sandy cla                       |                          |             |
| 1920  | 1,919.9                                 | 10.2          |                  |       |              | j                                     | <br><u></u> | 1        | · · ·           |                            | -  | <br>   |     |              |          |             | -<br>- 1,920.6                                |                          | 9.5         |
|       | 1,918.9                                 | 11.2          | 60/0.0<br>60/0.0 |       |              | 1                                     | •           |          |                 |                            |    | 60/0.0 |     |              |          | S.          | CRYSTALLINE<br>1,918.9 GNEISS                 |                          | 11.2        |
|       |   |               |                  |       |              |                                       |             |          |                 |                            |    |        |     |              |          |             | Boring Terminated at Ele<br>Crystalline Rock: | ration 1,918.9<br>GNEISS | ft In       |
|       | +                                       |               |                  |       |              |                                       |             |          |                 |                            |    |        |     |              |          |             |   |                          |             |
|       | + |               |                  |       |              |                                       |             |          |                 |                            |    |        |     |              |          |             |   |                          |             |
|       | ‡<br>+<br>+<br>+                        |               |                  |       |              |                                       |             |          |                 |                            |    |        |     |              |          |             |   |                          |             |
|       |   |               |                  |       |              |                                       |             |          |                 |                            |    |        |     |              |          |             |   |                          |             |
|       |   |               |                  |       |              |                                       |             |          |                 |                            |    |        |     |              |          | -           |   |                          |             |
|       | Ŧ                                       |               |                  |       |              |                                       |             |          |                 |                            |    |        |     |              |          |             |   |                          |             |

SHEET

| <b>VBS</b>     | 33313         | .1.1  |               |        | TI     | IP B-3           | 3868   |                         | COUNT    | Y MAC        | NC        |          |              |          | GEOLOGIST Elliott, D. C                     |          |               |       |
|----------------|---------------|-------|---------------|--------|--------|------------------|--------|-------------------------|----------|--------------|-----------|----------|--------------|----------|---|----------|---------------|-------|
| SITE           | DESCR         | IPTIO | <b>V</b> Brid | lge No | . 172  | on SR            | 1456   | (Rose Cr                | eek Road | d) over Li   | ttle      | Tennes   | see Ri       | iver     |   | C        | ROUND WT      | R (ff |
| BOR            | ING NO.       | B1-   | 4             |        | S      | TATIO            | N 17   | +87                     |          | OFFSE        | T 1       | IO ft LT |              |          | ALIGNMENT -L-                               |          | 0 HR.         | N/A   |
| COLI           | AR ELE        | EV. 1 | ,920.5        | ft     | TO     | OTAL [           | DEPTI  | H 21.8 ft               |          | NORTH        | ING       | 583,6    | 35           |          | <b>EASTING</b> 675,009                      | 2        | 4 HR.         | N/A   |
| RILL           | RIG/HAI       | MER I | FF./DA        | TE H   | FO0065 | CME-45           | 5C 82% | % 11/28/20 <sup>-</sup> | 11       |              |           | DRILL N  | <b>METHO</b> | D NW     | / Casing W/SPT & Core F                     | AMMER    | TYPE Autom    | atic  |
| DRIL           | LER C         | heek, | D. O.         |        | S      | TART [           | DATE   | 03/11/1                 | 4        | COMP.        | DA.       | ΓE 03/   | 11/14        |          | SURFACE WATER DEPTH                         | 1 2.3ft  |               |       |
| LEV            | DRIVE<br>ELEV | DEPTH |               | w co   |        |                  |        | BLOWS F                 |          |              |           | SAMP.    | <b>V</b> /   | L        | SOIL AND ROCK                               | DESCR    | IPTION        |       |
| (ft)           | (ft)          | (ft)  | 0.5ft         | 0.5ft  | 0.5ft  | 0                | 25     | 5 5                     | 60<br>L  | 75           | 100       | NO.      | MOI          |          | ELEV. (ft)                                  |          |               | PTH   |
|                |               |       |               |        |        |                  |        |                         |          |              |           |          |              |          |   |          |               |       |
| 925            |               | _     |               |        |        |                  |        |                         |          |              |           |          |              | -        |   |          |               |       |
| =              | -             | -     |               |        |        |                  |        |                         |          |              |           |          | V            |          | WATER SURFA                                 | CE (03/  | 11/14)        |       |
| 920            |               | -     |               |        |        |                  |        |                         |          |              | _         |          |              | -        | 1;838.5 WATER B                             |          |               | 6     |
|                | 1,919.5       | 1.0   | 100/0.3       |        |        |                  |        |                         |          | - 100/       | 0.3       |          |              |          | ALLU'<br>SAM                                | ID       |               |       |
|                | -             |       |               |        |        |                  |        |                         |          |              |           |          |              |          | WEATHERI<br>(gnei                           |          | K             |       |
| 915            | 1,914.5       | 6.0   | 100/0.3       |        |        |                  |        |                         |          | 100          |           |          |              |          | 1,914.1                                     |          |               | 6     |
|                | 1,913.0       | 7.5   | 60/0.0        |        |        |                  |        |                         |          | 100/         | 0.0       |          |              |          | CRYSTALLI<br>Sillamanite Bio                | tite GNE | ISS           |       |
| 910            | _             | -     |               |        |        |                  |        |                         |          |              |           |          |              |          | Run 1: 7.5-11.8' RE<br>Run 2: 11.8-16.8' RE | C=88%    | RQD=95%       |       |
|                | ]             | -     |               |        |        | ::               | ::     |                         |          |              | :         |          |              |          | Run 3: 16.8-21.8' RE                        | C=100%   | RQD=90%       |       |
|                | ]             | -     |               |        |        | ::               | : :    |                         |          |              | :         | DO 1     |              |          |   |          |               |       |
| 905            |               | -     |               |        |        | <u> </u>         |        |                         |          | <del> </del> | $\exists$ | RS-1     |              |          |   |          |               |       |
| 504            |               | -     |               |        |        |                  |        |                         |          |              | :         |          |              |          |   |          |               |       |
| 900            |               | -     |               |        |        |                  |        |                         |          |              | •         |          |              |          |   |          |               |       |
|                |               |       |               |        |        | <u> </u>         |        |                         |          | <u> </u>     | ·         | RS-2     |              |          | 1,898.7  Boring Terminated at E             | levation | 1 898 7 ft In | 21    |
| -              | 1             | -     |               |        | 2      |                  |        |                         |          |              |           |          |              | <u> </u> | Crystalline Ro                              | k: GNE   | ISS           |       |
|                | -             | -     |               |        |        |                  |        |                         |          |              |           |          | V            | <u> </u> |   |          |               |       |
|                | 1             | -     |               |        |        |                  |        |                         |          |              |           |          |              | l E      |   |          |               |       |
|                | -             | -     |               |        |        |                  |        |                         |          |              |           |          |              | 1 -      |   |          |               |       |
|                |               | -     |               |        |        | 12               |        |                         |          |              |           |          | PW- 5        | lE       |   |          |               |       |
| -              | 1             | -     |               |        |        | 7.0              |        |                         |          |              |           |          |              | lE       |   |          |               |       |
|                | -             | _     |               |        |        | V.               |        |                         |          |              |           |          |              | l E      |   |          |               |       |
|                | 1             | -     |               |        |        |                  |        |                         |          |              |           |          |              |          |   |          |               |       |
|                | _             | - '   |               |        |        |                  |        |                         |          |              |           |          |              | ΙĿ       |   |          |               |       |
|                | 1             | -     |               |        |        |                  |        |                         |          |              |           |          |              | <u> </u> |   |          |               |       |
|                | 1             | -     |               |        |        |                  |        |                         |          |              |           |          |              | ΙĿ       |   |          |               |       |
|                | -             | -     |               |        |        |                  |        |                         |          |              |           |          |              | <u> </u> |   |          |               |       |
|                | 1             | -     |               |        |        | 11<br>= 2        |        |                         |          |              |           |          |              | E        |   |          |               |       |
|                | _             | -     |               |        |        |                  |        |                         |          |              |           |          |              | -        |   |          |               |       |
|                |               | -     |               |        |        |                  |        |                         |          |              |           |          |              | F        |   |          |               |       |
| 11 22          | 1             |       |               |        |        |                  |        |                         |          |              |           |          |              | F        |   |          |               |       |
|                | 1             | -     |               |        |        |                  |        |                         |          |              |           |          |              | F        |   |          |               |       |
|                | 1             | -     |               |        |        |                  |        |                         |          |              |           |          |              | F        |   |          |               |       |
|                | 1             |       |               |        |        |                  |        |                         |          |              |           |          |              | F        |   |          |               |       |
|                | _             | -     |               |        |        |                  |        |                         |          |              |           |          |              | -        |   |          |               |       |
|                | -             |       |               |        |        |                  |        |                         |          |              |           |          |              |          |   |          |               |       |
| F <sub>3</sub> | _             | -     |               |        |        |                  |        |                         |          |              |           |          |              |          |   |          |               |       |
|                | 1             | -     |               |        |        |                  |        |                         |          |              |           |          |              |          |   |          |               |       |
|                | -             |       |               |        |        |                  |        |                         |          |              |           |          |              |          |   |          |               |       |
|                | _             | -     |               |        |        |                  |        |                         |          |              |           |          |              |          |   |          |               |       |
|                | -             | -     |               |        |        |                  |        |                         |          |              |           |          |              | F        |   |          |               |       |
|                |               |       |               |        |        | The state of the |        |                         |          |              |           |          |              |          |   |          |               |       |



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| WBS          | 33313                    | 5.1.1                     |             |  | TIP               | B-386                  | 88           | С                        | OUNT                    | YN          | MACON GEOLOGIST Elliott, D. C.   |             |
|--------------|--------------------------|---------------------------|-------------|--|-------------------|------------------------|--------------|--------------------------|-------------------------|-------------|--|-------------|
| SITE         | DESCR                    | IPTION                    | Brid        | lge No. 1  | 72 on :           | SR 14                  | 56 (Rose     | Creek                    | Road                    | vo (b       | er Little Tennessee River GROU   | ND WTR (ft) |
| BOR          | ING NO.                  | B1-A                      |             |  | STAT              | TION                   | 17+87        |                          |                         | OF          | FSET 10 ft LT ALIGNMENT -L- 0 HR.  | N/A         |
| COL          | LAR ELE                  | EV. 1,9                   | 920.5       | ft   | TOTA              | AL DE                  | PTH 21       | .8 ft                    |                         | NO          | RTHING 583,635 EASTING 675,009 24 HR.  | N/A         |
| DRIL         | RIG/HAI                  | MMER E                    | FF./DA      | TE HFO0  | 065 CM            | E-45C                  | 82% 11/28    | 3/2011                   |                         |             | DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE  | Automatic   |
| DRIL         | LER C                    | heek, [                   | ). O.       |  | STAF              | RT DA                  | TE 03/1      | 1/14                     |                         | CO          | MP. DATE 03/11/14 SURFACE WATER DEPTH 2.3ft  |             |
| COR          | E SIZE                   | NXWL                      |             |  | TOTA              | AL RUI                 | N 14.3 f     | t                        |                         |             |  |             |
| ELEV<br>(ft) | RUN<br>ELEV<br>(ft)      | DEPTH<br>(ft)             | RUN<br>(ft) | DRILL<br>RATE<br>(Min/ft)  | REC.<br>(ft)<br>% | JN<br>RQD<br>(ft)<br>% | SAMP.<br>NO. | STR<br>REC.<br>(ft)<br>% | ATA<br>RQD<br>(ft)<br>% | L<br>O<br>G | DESCRIPTION AND REMARKS ELEV. (ft)   | DEPTH (ft)  |
| 1912.9       | 4 040 0                  | 7,5                       |             |  |                   |                        |              |                          |                         |             | Begin Coring @ 7.5 ft  |             |
| 1910         | 1,913.0<br>-<br>1,908.7  | - 7.5<br>-<br>-<br>- 11.8 | 4.3         | N=60/0.0<br>0:15/0.3<br>1:01/1.0<br>1:20/1.0<br>1:14/1.0<br>1:12/1.0 | (3.8)             | 95%                    |              |                          |                         |             | CRYSTALLINE ROCK Recovered rock is white-gray-brown, fresh, hard, Sillamanite Bioti GNEISS. Fracture spacing is very to moderately close. Joints are fro to nearly vertical. (continued) | e<br>n 40°  |
| 1905         |                          | -<br>-<br>-               | 5.0         | 1:03/1.0<br>1:12/1.0<br>1:15/1.0<br>1:08/1.0                         | (5.0)<br>100%     | (4.7)<br>94%           | RS-1         |                          |                         |             |  |             |
| 1900         | _1,903.7_<br>-<br>-<br>- | - 16.8<br>-<br>-          | 5.0         | 1:18/1.0<br>1:09/1.0<br>1:20/1.0<br>1:15/1.0<br>1:29/1.0             | (5.0)<br>100%     | (4.5)<br>90%           |              |                          |                         |             |  |             |
|              | 1,898.7                  | 21.8                      |             | 1:23/1.0   |                   |                        | RS-2         |                          |                         |             | - 1,898.7  Paring Torrelated at Floration 1,909.7 ff in Constalling Rock: CNE  | 21.8        |
|              |                          |                           |             | 1.23/1.0   |                   |                        | RS-2         |                          |                         |             | Boring Terminated at Elevation 1,898.7 ft In Crystalline Rock: GNE   |             |
|              |                          |                           |             |  |                   |                        |              |                          |                         |             |  |             |

SHEET

| VBS  | 33313                                   | .1.1    |               |           | Т      | IP B-3 | 3868  |             | COUNT   | Y M     | ACON     |         |            |        | GEOLOGIST Elliott, I                | D. C.      |               |          |
|------|---|---------|---------------|-----------|--------|--------|-------|-------------|---------|---------|----------|---------|------------|--------|-------------------------------------|------------|---------------|----------|
| ITE  | DESCR                                   | IPTIO   | <b>V</b> Bric | ige No    | . 172  | on SR  | 1456  | (Rose C     | eek Roa | d) ove  | r Little | Tennes  | see R      | iver   |                                     |            | GROUND        | WTR (f   |
| ORI  | NG NO.                                  | B1-E    | 3             |           | S      | TATION | N 17  | 7+74        |         | OFF     | SET 8    | 3 ft RT |            |        | ALIGNMENT -L-                       |            | 0 HR.         | N//      |
| OLL  | AR ELE                                  | V. 1    | 920.4         | ft        | Т      | OTAL [ | DEPT  | TH 12.2 f   | ť       | NOR     | THING    | 583,6   | 513        |        | <b>EASTING</b> 675,006              |            | 24 HR.        | N//      |
| RILL | RIG/HAI                                 | MER E   | FF./DA        | TE H      | FO0065 | CME-45 | 5C 82 | 2% 11/28/20 | )11     |         |          | DRILL N | METHO      | D N    | V Casing W/SPT & Core               | HAMM       | ER TYPE A     | utomatic |
| RILI | LER C                                   | heek, l | D. O.         |           | S      | TART D | DATE  | 03/11/1     | 4       | CON     | IP. DA   | TE 03/  |            |        | SURFACE WATER DE                    |            |               |          |
| EV   | DRIVE                                   | DEPTH   | BLC           | OW CO     | UNT    |        |       | BLOWS       | PER FOO | T T     |          | SAMP.   | <b>V</b> / | L      | <del></del>                         |            |               | ~        |
| ft)  | ELEV (ft)                               | (ft)    | 0.5ft         | 0.5ft     | 0.5ft  | 0      | 2     | 25          | 50      | 75      | 100      | NO.     | MOI        | O<br>G | SOIL AND RO                         | JCK DESC   | RIPTION       | DEPTH    |
|      |   |         |               |           |        |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
| 25   |   | _       |               |           |        |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
|      | -                                       | -       |               |           |        |        |       |             |         |         |          |         |            |        | WATER SU                            | DEACE (n   | 3/11/14\      |          |
|      |   |         |               |           | 12     |        |       |             |         |         | 8        |         |            | 1-1    |                                     | R BOTTO    |               |          |
| 20   | _<br>1,918.7-                           | - 17    |               |           |        |        |       | F           | T       | . T     |          | 1       |            |        | - CRYST                             | ALLINE R   | OCK           |          |
|      | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |         | 60/0.0        |           |        | ::     |       | : : : :     | : : :   | .   : : | 60/0.0   |         |            |        | Sillamanite<br>Run 1: 1.7-3.2':     | REC=1009   | % RQD=100%    | 6        |
| 15   | _                                       | -       |               |           |        | • •    |       |             |         |         |          |         |            |        | Run 2: 3.2-8.2'<br>Run 3: 8.2-12.2' |            |               | ,        |
|      | 1                                       |         |               |           |        |        |       | ::::        |         |         | ::       |         |            |        |                                     |            |               |          |
|      | 1                                       |         |               |           |        | ::     |       |             |         |         |          |         |            |        |                                     |            |               |          |
| 10   | -                                       | -       | _             |           |        |        |       |             | l       |         |          | RS-3 /  |            |        | - A-4                               |            |               |          |
| -    |   |         |               | -         |        | H      |       |             |         |         |          |         |            | 97     | 1,908.2<br>Boring Terminated        | at Elevati | on 1,908.2 ft | 1:<br>In |
|      | +                                       |         |               |           |        |        |       |             |         |         |          |         |            | l F    | Crystalline                         | Rock: Gl   | NEISS         |          |
|      | 7                                       |         |               |           |        |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
|      | 1                                       |         |               |           |        |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
|      | 7                                       |         |               |           |        |        |       |             |         |         |          |         |            | -      | •                                   |            |               |          |
|      | 1                                       |         |               |           |        |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
|      | +                                       |         |               |           |        |        |       |             |         |         |          |         | =          |        | _                                   |            |               |          |
|      | ‡                                       |         |               |           |        |        |       |             |         |         |          |         | , ,        |        |                                     |            |               |          |
|      | ‡                                       |         |               |           |        |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
| 1    | 7                                       |         |               |           |        |        |       |             |         |         |          |         | š 11 –     | -      | tan ne estimate de                  |            |               |          |
|      | 1                                       |         |               |           |        |        |       |             |         |         |          |         |            | -      |                                     |            |               |          |
|      | +                                       |         |               |           |        |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
|      | ‡                                       |         |               |           | 1274   |        |       |             |         |         |          |         |            | -      |                                     |            |               |          |
|      | ‡                                       |         |               |           |        |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
|      | 7                                       |         |               |           |        |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
|      | 1                                       |         |               |           |        |        |       |             |         |         |          |         | 1162       |        |                                     |            |               |          |
|      | +                                       |         |               |           |        |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
|      | ‡                                       |         |               | ,         |        |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
| 1    | ‡                                       |         |               |           | 5.     |        |       |             |         | ٠       |          |         |            | -      |                                     |            |               |          |
| -    | +                                       |         |               |           | -      |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
| -1   | 1                                       |         |               |           | -      |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
|      |   |         |               |           | 1      |        |       |             |         |         |          |         |            | -      |                                     |            |               |          |
|      | ‡                                       |         |               |           | 1:     |        |       |             |         |         |          |         |            | E      |                                     |            |               |          |
|      | 1                                       |         |               | 7-        |        | -      |       |             |         |         |          |         |            |        |                                     |            |               |          |
|      | +                                       |         |               | -<br>14 g |        |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
|      | 1                                       |         |               |           |        |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
|      | -                                       |         |               |           |        |        |       |             |         |         |          |         |            | F      |                                     |            |               |          |
|      | 7                                       |         |               |           |        | 2 1 11 |       |             |         |         |          |         |            |        |                                     |            |               |          |
|      | ‡                                       |         |               |           |        |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
|      | _                                       | -       |               |           |        |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
|      | . ‡                                     |         |               |           |        |        |       |             |         |         |          |         |            |        |                                     |            |               |          |
|      | +                                       | •       |               |           |        |        |       |             |         |         |          |         |            | 1 -    |                                     |            |               |          |



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| VAIDO  | 33313     |       |      |  |                   |                                | TRE             |             |                  | V 1    | 14001                                   | OFOLOGIST FILL D   |                            |                        |            |
|--------|-----------|-------|------|--|-------------------|--------------------------------|-----------------|-------------|------------------|--------|---|--|----------------------------|------------------------|------------|
|        |           |       | Brid | go No. 1   | ·                 | B-386                          |                 |             |                  |        | ACON er Little Tennessee River          | GEOLOGIST Elliott, D.  |                            | GROLIN                 | D WTR (ft) |
|        | ING NO.   |       |      | ge No. 1   |                   |                                | 17+74           | Creei       | Road             |        | FSET 8 ft RT                            | ALIGNMENT -L-  |                            | OHR.                   | N/A        |
|        | LAR ELI   |       |      | ff   |                   |                                | PTH 12.         | 2 ff        |                  | -      | RTHING 583,613                          | <b>EASTING</b> 675,006   |                            | 24 HR.                 | N/A        |
|        |           |       |      |  |                   |                                | 82% 11/28       |             |                  | NO     |   | Casing W/SPT & Core  |                            |                        | Automatic  |
|        | LER C     |       |      | 111 00   |                   |                                | TE 03/1         |             |                  | CO     | MP. DATE 03/12/14                       | SURFACE WATER DEP  |                            |                        | 7 tatomaso |
|        | E SIZE    |       |      |  |                   |                                | <b>v</b> 10.5 f |             |                  | -      | WII. DATE OUT TETT                      | OON AGE WATER BEI  | 111 1.0                    |                        |            |
| ELEV   | T 51111   | DEPTH |      | DRILL  | RI                | JN I                           | SAMP.           | STR<br>REC. | ATA              | L      |   |  |                            |                        |            |
| (ft)   | ELEV (ft) | (ft)  | (ft) | RATE<br>(Min/ft)   | REC.<br>(ft)<br>% | RQD<br>(ft)<br>%               | NO.             | (ft)        | RQD<br>(ft)<br>% | O<br>G | ELEV. (ft)                              | ESCRIPTION AND REMARKS   | S                          |                        | DEPTH (ft  |
| 1918.7 |           |       |      |  |                   |                                |                 |             |                  |        |   | Begin Coring @ 1.7 ft  |                            |                        |            |
| 1915   | 1:818:3-  | -     |      | N=60/0.0<br>0:57/0.5<br>1:40/1.0<br>2:31/1.0<br>2:57/1.0<br>3:34/1.0<br>3:21/1.0 | 98%               | (1.5)<br>100%,<br>(4.9)<br>98% |                 |             |                  |        | Rock is gray, fres Fractures are predor | CRYSTALLINE ROCK<br>sh, hard to very hard, Sillaman<br>minantly low angle and modera | ite Biotite<br>Itely close | GNEISS.<br>. (continue | ed)        |
| 1910   | 1,908.2   | 12.2  | 4.0  | 6:52/1.0<br>7:37/1.0<br>11:55/1.0<br>17:21/1.0                                   | (3.7)<br>93%      | (3.0)<br>75%                   | RS-3 /          |             |                  |        | 1,908.2                                 |  |                            | · · ·                  | 12.2       |
|        |           |       |      |  |                   |                                |                 |             |                  |        | Boring Terminated                       | at Elevation 1,908.2 ft In Cryst   | alline Roc                 | k: GNEIS               | S          |

SHEET

|       | 33313          |  |         |       |        | P B-3868                |             | MACON         |          |            |        | GEOLOGIST Elliott, D. C                      |                  |               |
|-------|----------------|--|---------|-------|--------|-------------------------|-------------|---------------|----------|------------|--------|--|------------------|---------------|
|       |                |  |         | dge N | o. 172 | on SR 1456 (Rose Cr     | eek Road    | ) over Little | Tennes   | see R      | iver   |  | GROUI            | ND WTR (ff    |
| 30R   | ING NO         | B2-A   | 4       |       | S      | <b>TATION</b> 18+91     |             | OFFSET 1      | 14 ft LT |            |        | ALIGNMENT -L-                                | 0 HR.            | N/A           |
| COL   | LAR ELI        | EV. 1  | ,919.6  | ft    | T      | OTAL DEPTH 51.8 ft      |             | NORTHING      | 583,6    | 885        |        | <b>EASTING</b> 675,101                       | 24 HR.           | N/A           |
| DRILI | RIG/HA         | MMER E                                       | EFF./D# | ATE H | FO0065 | CME-45C 82% 11/28/20    | 11          |               | DRILL I  | METHO      | D N    | W Casing W/SPT & Core H.                     | AMMER TYPE       | Automatic     |
| DRIL  | LER C          | heek,  | D. O.   |       | S      | TART DATE 03/10/1       | 4           | COMP. DA      | TE 03/   | 11/14      |        | SURFACE WATER DEPTH                          | 2.5ft            |               |
| LEV   | DRIVE          | DEPTH  | BLO     | ow cc | DUNT   | BLOWS                   | PER FOOT    |               | SAMP.    | <b>V</b> / | L      | 2011 1112 20016                              |                  |               |
| (ft)  | ELEV<br>(ft)   | (ft)   | 0.5ft   | 0.5ft | 0.5ft  | 0 25                    | 50          | 75 100        | NO.      | MOI        | O<br>G | SOIL AND ROCK<br>ELEV. (ft)                  | DESCRIPTION      | DEPTH         |
|       |                |  |         |       |        |                         |             |               |          | V          |        | WATER SURFA                                  | CE (03/10/14)    |               |
| 1920  |                | jan, j                                       |         | -     |        |                         |             |               |          |            |        |  |                  |               |
|       | 1,918.6-       | 1.0  | 14      | 40    |        | · · · ·   ·   · · · · · | T           | T             | <u> </u> |            | 000    | 1,919.6 WATER BO<br>- ALLUV                  | IAL              | 0             |
|       |                | F  | 11      | 13    | 6      | 19                      |             |               |          |            | 000    | - GRAVEL 8<br>- 1,916.5                      |                  | 3.            |
| 1915  | _              | -  |         |       |        |                         |             |               |          |            |        | - SAPRO Orange-brown-black                   |                  | T             |
|       | 1,913.6-       | 6.0  | 8       | 10    | 7      |                         |             | ::::          |          |            |        | -  | chilo dariaj diz |               |
| 0.10  | _              |  |         |       |        | 1                       | : : : :     |               |          |            |        |  |                  |               |
| 910   | 1,908.6-       | - 11 0                                       |         |       |        |                         |             |               |          |            |        |  |                  |               |
|       | _1,300.0_      |  | 6       | 6     | 8      | 914                     |             |               |          |            |        |  |                  |               |
| 905   | -              | _  |         |       |        | ::   : : : :            |             |               |          |            |        |  |                  |               |
|       |                | -<br>- 16.0                                  |         |       |        |                         |             |               |          |            |        | -  |                  |               |
|       |                | -  | 7       | 11    | 8      | 19                      |             |               |          |            |        |  |                  |               |
| 900   | _              | -  |         |       |        |                         |             |               |          |            |        | -<br>  |                  | 200           |
|       | 1,898.6-       | 21.0   | 18      | 30    | 70/0.4 |                         |             | † T T T T     |          |            | 110    | WEATHERE                                     |                  | 20            |
|       | _              | -  | "       | 00    | 7070.4 |                         |             | 100/0.9       |          |            |        | gneis (gneis                                 | ss)              |               |
| 895   | -              | -  |         |       |        |                         |             |               |          |            |        |  |                  |               |
|       | _1,893.6-<br>- | - 26.0<br>-                                  | 21      | 57    | 43/0.3 |                         |             |               |          |            |        |  |                  |               |
| 000   |                | -  |         |       |        |                         |             | 100/0.8       |          |            |        | 1,891.2                                      |                  | 28            |
| 890   | 1,888.6        | -<br>- 31 N                                  |         |       |        |                         |             |               |          |            |        | CRYSTALLIN<br>Sillimanite Bioti              | ite GNEISS       |               |
| Ī     | 1,000.0        |  | 60/0.0  |       |        |                         |             | 60/0.0        |          |            |        | Run 1: 31.0-31.8' RE<br>Run 2: 31.8-36.8' RE |                  |               |
| 885   | -              |  |         |       |        |                         |             |               |          |            |        |  | rrel unlatched   |               |
|       | 7              |  |         |       |        |                         |             |               |          |            |        | Run 4: 41.8-46.8' RE                         | C=92% RQD=8      | 88%           |
|       | 1              | -  |         |       |        |                         |             |               |          |            |        | Run 5: 46.8-51.8' REC                        | C=100% RQD=      | 96%           |
| 880   | _              |  |         |       |        |                         |             |               |          |            |        | <u>.</u>                                     |                  |               |
|       | 1              | •  |         |       |        |                         |             |               | RS-5     |            |        | •  |                  |               |
|       | -              | •  |         |       |        |                         |             |               |          |            |        |  |                  |               |
| 875   | 4              | _  |         |       |        |                         |             |               |          |            |        |  |                  |               |
|       | 1              |  |         | 100   |        |                         |             |               |          |            |        |  |                  |               |
| 870   | 1              |  |         |       |        |                         |             | ::::          | RS-6     |            |        |  |                  |               |
| 070   | 1              |  |         |       |        |                         |             |               |          |            |        | -  |                  |               |
|       |                | <u>.                                    </u> |         |       |        | 1                       | <del></del> | 1             |          |            | VP/1   | . 1,867.8  Boring Terminated at El           | evation 1 867 8  | 51<br>3 ft ln |
|       | 1              |  |         |       |        |                         |             |               |          |            |        | - Crystalline Rock                           |                  |               |
|       | 1              |  |         |       |        |                         |             |               |          |            |        |  |                  |               |
|       | +              |  |         |       |        |                         |             |               |          |            |        |  |                  |               |
|       | 7              |  |         | - "   |        |                         |             |               |          |            |        |  |                  |               |
|       | 1              |  | · · ·   | 31    |        |                         |             |               |          |            |        |  |                  |               |
|       | 1              |  |         |       |        |                         |             |               |          |            |        |  |                  |               |
|       | -              |  |         |       |        |                         |             |               |          |            | -      |  |                  |               |
|       | +              |  |         |       |        |                         |             |               |          |            | F      |  |                  |               |
| 3     | ‡              |  |         |       |        |                         |             |               |          |            |        |  |                  |               |
|       | †              |  |         |       |        |                         |             |               |          |            |        |  |                  |               |
|       | 1              |  |         |       |        |                         |             |               |          |            |        |  |                  |               |
|       | 7              |  |         |       |        |                         |             |               |          |            | -      |  |                  |               |
|       | 7              |  |         |       |        |                         |             |               |          |            |        |  |                  |               |
|       | ‡              |  |         |       |        |                         |             |               |          |            |        |  |                  |               |
|       | . +            |  |         |       | 1      |                         |             |               |          |            | -      |  |                  |               |



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| VA/DS        | 22212                |                 |             | REB  | 1                        |                   |                |      |                          |    | 44.001                        |  | <del></del>  |           |            |
|--------------|----------------------|-----------------|-------------|--|--------------------------|-------------------|----------------|------|--------------------------|----|-------------------------------|--|--------------|-----------|------------|
|              | 33313                |                 | l Dei-      | lao No. 4  |                          | B-386             |                |      |                          |    | ACON                          | GEOLOGIST Elliott,   | D. C.        | CPOLIN    | D MATE (4) |
|              |                      |                 |             | ige No. 1  |                          |                   |                | Cree | ek Road                  | T  | er Little Tennessee River     |  |              |           | D WTR (ft) |
|              | ING NO.              |                 |             | £L.  |                          |                   | 18+91          | 0.5  |                          | -  | FSET 14 ft LT                 | ALIGNMENT -L-  |              | 0 HR.     | N/A        |
|              | LAR ELI              |                 |             |  |                          |                   | <b>PTH</b> 51. |      |                          | NO | RTHING 583,685                | <b>EASTING</b> 675,101                                     |              | 24 HR.    | N/A        |
|              |                      |                 |             | TE HFOO  |                          |                   |                |      |                          | Г  |                               | Casing W/SPT & Core  |              |           | Automatic  |
|              | LER C                |                 |             |  | <del></del>              |                   | TE 03/1        |      |                          | co | MP. DATE 03/11/14             | SURFACE WATER DE   | PTH 2.5      | ift       |            |
| -            | ESIZE                | r               |             | Labit  | A Company of the Company | AL RUI<br>Un      | N 20.8 f       |      | DATA                     | _  |                               |  |              |           |            |
| ELEV<br>(ft) | LLEV                 | DEPTH<br>(ft)   | RUN<br>(ft) | INVIL  | REC.<br>(ft)<br>%        | RQD<br>(ft)<br>%  | SAMP.<br>NO.   | REC. | RATA<br>RQD<br>(ft)<br>% | O  | D                             | ESCRIPTION AND REMAR                                       | KS           |           |            |
|              | (ft)                 |                 | (1.9)       | (Min/ft)   | %                        | %                 |                | %    | %                        | G  | ELEV. (ft)                    |  |              |           | DEPTH (ft) |
| 1888.59      | 1;888-6-<br>1;887-8- | - 31.Q          | 0.8         | N=60/0.0   | (0.7)                    | (0.5)             |                |      |                          |    | -                             | Begin Coring @ 31.0 ft<br>CRYSTALLINE ROCK                 |              |           |            |
| 1005         | 1,887.82             | <u>_31.8</u> _/ | 5.0         | N=60/0.0<br>0:53/1.0<br>1:04/1.0                         |                          | 63%               |                |      |                          |    | Gray-white-green,             | very slightly weathered to fr<br>EISS. Fracture spacing is | esh, hard to | very hard | i<br>ee    |
| 1885         | -                    |                 |             | 1:04/1.0<br>0:52/1.0<br>0:58/1.0<br>1:03/1.0<br>1:00/1.0 | (1.4)<br>28%             | (0.0)<br>0%       |                |      |                          |    | Joints vary from low          | to high angle. Core Barrel                                 | unlatched d  | uring Run | 2.         |
|              | 1,882.8_             | 36.8            | 5.0         | 1:00/1.0   | (5.0) <sup>t</sup>       | Barrel<br>nlatche | d              |      |                          |    |                               | (continued)  |              |           |            |
| 1880         | -                    |                 | 0.0         | 1:09/1.0<br>1:11/1.0<br>1:17/1.0                         | 100%                     | (4.1)<br>82%      |                |      |                          |    |                               |  |              |           |            |
|              | 1,877.8_             | 41.8            |             | 1:15/1.0   |                          | 0270              | RS-5           |      |                          |    |                               |  |              |           |            |
|              | -1,077.02            | -               | 5.0         | 1:09/1.0   | (4.6)                    | (4.4)             |                |      |                          |    |                               |  |              |           |            |
| 1875         | _                    | -               |             | 1:21/1.0   | 92%                      | 88%               |                |      |                          |    | <u>.</u>                      |  |              |           |            |
|              | 1,872.8              | 46.8            |             | 1:19/1.0<br>1:21/1.0                                     |                          |                   |                |      |                          |    |                               |  |              |           |            |
| 1870         | -                    | -               | 5.0         | 1:31/1.0<br>1:39/1.0                                     | (5.0)<br>100%            | (4.8)<br>96%      | RS-6           |      |                          |    |                               |  |              |           |            |
| 1070         | _                    |                 |             | 1:47/1.0<br>1:29/1.0                                     |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              | 1,867.8_             | 51.8            |             | 1:30/0.0   |                          |                   |                |      |                          |    | _ 1,867.8 Boring Terminated a | t Elevation 1,867.8 ft In Cry                              | stalline Roo | k: GNEIS  | 51.8<br>S  |
|              | -                    | -               |             |  |                          |                   |                |      |                          |    | _                             |  |              |           |            |
|              | -                    |                 |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              | -                    |                 |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              | _                    |                 |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              | -                    | -               |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              | -                    |                 |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              | -                    |                 |             |  |                          |                   |                |      |                          |    | -                             |  |              |           |            |
|              | -                    | -               |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              | -                    |                 |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              | _                    | -               |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              |                      |                 |             |  |                          |                   |                |      |                          |    | •                             |  |              |           |            |
|              | _                    |                 |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              | 1                    | -               |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              |                      |                 |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              | -                    | -               |             |  |                          |                   |                |      |                          |    | -                             |  |              |           |            |
|              |                      |                 |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              | _                    | -               |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              | -                    | -               |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              |                      |                 |             |  |                          |                   |                |      |                          | E  |                               |  |              |           |            |
|              | _                    | -               |             |  |                          |                   |                |      |                          |    | -                             |  |              |           |            |
|              |                      |                 |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              | -                    |                 |             |  |                          |                   |                |      |                          | -  |                               |  |              |           |            |
|              |                      | _               |             |  |                          |                   |                |      |                          |    |                               |  |              |           | x n 40     |
|              | -                    | -               |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              |                      |                 |             |  |                          |                   |                |      |                          | E  |                               |  |              |           | 1          |
|              |                      |                 |             |  |                          |                   |                |      |                          | -  |                               |  |              |           |            |
|              |                      |                 |             |  |                          |                   |                |      |                          | F  |                               |  |              |           |            |
|              |                      |                 |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              |                      |                 |             |  |                          |                   |                |      |                          | 1  |                               |  |              |           |            |
|              |                      | -               |             |  |                          |                   |                |      |                          | 1  |                               |  |              |           |            |
|              | _                    |                 |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |
|              |                      |                 |             |  |                          |                   |                |      |                          |    |                               |  |              |           |            |

SHEET

| WBS   | 3331         | 3.1.1         |         |        | TI     | P B-3868    |            | COUNT     | MACON         |          |              |     |   |                    |
|-------|--------------|---------------|---------|--------|--------|-------------|------------|-----------|---------------|----------|--------------|-----|---|--------------------|
| SITE  | DESC         | RIPTIO        | N Bri   | dge No | o. 172 | on SR 1456  | (Rose Cr   | eek Road  | ) over Little | Tennes   | see Rive     | r   |   | GROUND WTR (       |
| BOR   | ING NO       | . B2-l        | В       |        | S      | TATION 18   | +89        |           | OFFSET        | 11 ft RT |              |     | ALIGNMENT -L-                                       | 0 HR. N            |
| COL   | LAR EL       | <b>EV</b> . 1 | ,919.3  | ft     | T      | OTAL DEPT   | H 51.9 f   | t         | NORTHIN       | G 583,6  | 661          |     | <b>EASTING</b> 675,110                              | 24 HR. N/          |
| DRILI | RIG/HA       | MMER          | EFF./D# | ATE H  | FO0065 | CME-45C 829 | % 11/28/20 | <br>111   |               | DRILL    | METHOD       | NV  |   | MER TYPE Automatic |
| DRIL  | LER (        | Cheek,        | D. O.   |        | S      | TART DATE   | 03/11/1    | 4         | COMP. DA      |          |              |     | SURFACE WATER DEPTH 3                               |                    |
| LEV   | DRIVE        | DEPTH         | BL      | ow co  | UNT    |             | BLOWS      | PER FOOT  |               | SAMP.    | V/ 1         |     |   |                    |
| (ft)  | ELEV<br>(ft) | (ft)          | 0.5ft   | 0.5ft  | 0.5ft  | 0 2         | 5 .        | 50        | 75 100        | NO.      | MOI          |     | SOIL AND ROCK DES                                   | SCRIPTION<br>DEPTH |
|       |              |               |         |        |        |             |            |           |               |          |              | _   | WATER SURFACE (                                     |                    |
| 1920  |              | ľ             |         |        |        |             |            |           |               |          |              |     |   |                    |
|       | 1,918.3      | 1.0           |         |        |        | 1           | · · · · ·  | · · · · · | T             | -        | 00           | 20- | - 1,919.3 GROUND SURF                               |                    |
|       |              | Ŧ             | 5       | 8      | 8      | 😝 16        |            |           | : : : :       |          | 000          |     | Gray-brown-tan GRAV                                 |                    |
| 915   | _            | Ŧ             |         |        |        |             |            |           |               |          |              | **  | - 1,915.6<br>- SAPROLITE                            |                    |
|       | 1,913.3      | 6.0           | 5       | 10     | 9      |             |            |           |               |          |              |     | Brown-gray-orange-blac                              | k silty SAND       |
| 910   |              | ‡             |         |        |        | 1 / .       |            |           |               |          |              |     | 1 010 1   |                    |
| 310   | 1,908.3      | 110           |         |        |        | /           |            |           | ·             |          |              |     | 1,910.1<br>SAPROLITE                                |                    |
|       | 1,800.0      | -11.0         | 3       | 4      | 5      | . <b>9</b>  |            |           |               |          |              | 壯   | Brown-gray-orange fine                              | sandy SILT         |
| 905   | -            | 1             |         |        |        | .           |            |           |               |          |              | æ   |   |                    |
|       | 1,903.3      | 16.0          |         |        |        | : 1: :      |            |           |               |          |              | ₩F  |   |                    |
| =     |              |               | 5       | 4      | 8      | 12 .        |            |           |               |          |              | ¥F  |   |                    |
| 900   | -            | Ŧ             |         |        |        |             |            |           |               |          |              | **  | _   |                    |
|       | 1,898.3      | 21.0          | 9       | 12     | 13     | : : : \     |            |           | ::::          |          |              | *   |   |                    |
| 895   |              | ‡             |         |        |        | ,           |            |           |               |          |              | *   |   |                    |
| 300   | 1,893.3      | 26.0          |         |        |        | ,           |            |           |               |          |              | t   |   |                    |
|       | _1,030.0_    | 20.0          | 8       | 11     | 10     | 21          |            |           |               |          |              | 士   |   |                    |
| 890   | _            | _             |         |        |        |             |            |           |               |          |              | H   | 1,890.0   | 29                 |
|       | 1,888.3      | 31.0          | 400/0/  |        |        | ::::        |            | ::::      |               |          |              |     | WEATHERED R<br>(gneiss)                             |                    |
|       | 1,886.3      | 33.0          | 100/0.2 |        |        |             |            | 14.11     | 100/0.2       |          |              | -   | CRYSTALLINE F                                       |                    |
| 885   | -            | -             | 60/0.0  |        |        |             |            |           | 60/0.0        |          | المجمع<br>ما | 1   | Sillamanite Biotite (<br>Run 1: 33.0-36.9' REC=9    |                    |
|       |              | F             |         |        |        | : : : :     | :::::      | ::::      | ::::          |          | الخوا        | 1   | Run 2: 36.9-41.9' REC=10<br>Run 3: 41.9-46.9' REC=9 |                    |
| 880   |              | ļ             |         |        |        |             |            | : : : :   | ::::          |          | الجرا        | 1   | Run 4: 46.9-51.9' REC=10                            |                    |
|       | -            |               |         |        |        |             |            |           |               |          |              | 1   |   |                    |
|       |              | -             |         |        |        |             | : : : :    | : : : :   | ::::          | RS-7     |              | 1   |   |                    |
| 875   | _            | ‡             |         |        |        |             |            |           |               |          |              | 1   |   |                    |
|       |              | _             |         |        |        |             |            | : : : :   | ::::          |          |              | 1   |   |                    |
|       |              |               |         |        | 5.0    |             |            |           | ::::          |          |              | 1   |   |                    |
| 870   | -            | -             |         |        |        |             |            |           |               | RS-8     | 200          | -   | •   |                    |
| 7 7   |              |               | ļ       |        |        |             |            |           |               |          | Ž.           | 1   | 1,867.4   | 51                 |
|       |              | -             |         |        |        |             |            |           |               |          |              | F   | Boring Terminated at Elevat<br>Crystalline Rock: G  |                    |
|       | -            | F             |         |        |        |             |            |           |               |          |              | F   |   |                    |
|       |              | ‡             |         |        |        |             |            |           |               |          |              | F   |   |                    |
|       | _            | _             |         |        | 24, 1  |             |            |           |               |          |              | E   |   |                    |
|       |              |               |         |        |        |             |            |           |               |          |              | E   |   |                    |
| -57   |              | -             |         |        |        |             |            |           |               |          |              | F   |   |                    |
|       | _            | -             |         |        |        |             |            |           |               |          |              | F   |   |                    |
|       |              | -             |         |        |        |             |            |           |               |          |              | F   |   |                    |
|       |              | <u> </u>      |         |        |        |             |            |           |               |          |              | E   |   |                    |
|       | -            | -             |         |        |        |             |            |           |               |          |              | F   | •   |                    |
|       |              | F             |         |        |        |             |            |           |               |          |              | F   |   |                    |
|       |              | -             |         |        |        |             |            |           |               |          |              | -   |   |                    |
|       | -            |               |         |        |        |             |            |           |               |          |              | F   |   |                    |
|       |              | <u> </u>      |         |        |        |             |            |           |               |          |              | 1   |   |                    |
|       |              | +             |         |        |        |             |            |           |               |          |              | F   |   |                    |



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| WRS     | 33313        |       |            |  |               | B-386         |         |             |                  | ~ N           | MACON                         | GEOLOGIST Elliott, D.   | C             |            |            |  |
|---------|--------------|-------|------------|--|---------------|---------------|---------|-------------|------------------|---------------|-------------------------------|---|---------------|------------|------------|--|
|         |              |       | J Bric     | lae No. 1  |               |               |         |             |                  |               | er Little Tennessee River     | GEOLOGIST EIIIOtt, D.   |               | ROLINI     | WTR (ft)   |  |
|         | B2-E         |       | 190 110. 1 |  |               | 18+89         | Cicci   | · Noai      | <del></del>      | FSET 11 ft RT | ALIGNMENT -L-                 |   | 0 HR. N/A     |            |            |  |
|         | LAR ELI      |       |            | ff   |               |               | PTH 51  | 9 ff        |                  | -             | RTHING 583,661                | <b>EASTING</b> 675,110  |               | 24 HR. N/A |            |  |
| -       |              |       |            | TE HFOO  |               |               |         |             |                  | 110           | <del></del>                   | Casing W/SPT & Core   | HAMMER        |            |            |  |
|         | LER C        |       |            |  |               |               | TE 03/1 |             |                  | CO            | MP. DATE 03/11/14             | SURFACE WATER DEP   |               |            |            |  |
|         | E SIZE       |       |            |  |               |               | N 18.9  |             |                  |               | 100 / 1717 OO / 1717 T        | OOK AGE WATER BEI   |               |            |            |  |
| ELEV    | RUN<br>ELEV  | DEPTH | т          | DRILL  |               | UN RQD        | SAMP.   | STF<br>REC. | ATA              | L             |                               |   |               |            |            |  |
| (ft)    | ELEV<br>(ft) | (ft)  | (ft)       | RATE<br>(Min/ft)   | (ft)<br>%     | (ft)          | NO.     | (ft)        | RQD<br>(ft)<br>% | O<br>G        | D<br>ELEV. (ft)               | ESCRIPTION AND REMARKS  | 3             |            | DEPTH (ft) |  |
| 1886.28 |              |       |            |  |               |               |         |             |                  |               |                               | Begin Coring @ 33.0 ft  |               |            |            |  |
| 1885    | 1,886.3      | 33.0  | 3.9        | N=60/0.0<br>1:20/0.9<br>1:48/1.0<br>1:57/1.0<br>1:39/1.0 | (3.5)         | (2.2)<br>56%  |         |             |                  |               | - Grav-white-green.           | CRYSTALLINE ROCK<br>very slightly weathered to fres                         | h, hard to ve | ery hard   |            |  |
|         | 1,882.4      | 36.9  |            | 1:57/1.0   |               |               |         |             |                  |               | Sillamanite Biotite Gr        | neiss. Fracture spacing is clos<br>s are at variable angles. <i>(cont</i> a | e to modera   | itely clos | e.         |  |
| 1880    |              |       | 5.0        | 1:44/1.0<br>1:50/1.0<br>1:54/1.0                         | (5.0)<br>100% | (4.0)<br>80%  |         |             |                  |               | -                             | and at random angles. (serin  |               |            |            |  |
|         |              | Ī     |            | 1:38/1.0   |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         | 1,877.4      | 41.9  | 5.0        | 1:31/1.0<br>1:54/1.0                                     | (4.7)         | (4.7)         | RS-7    |             |                  |               |                               |   |               |            |            |  |
| 1875    | -            | -     |            | 2:01/1.0<br>1:41/1.0                                     | 94%           | 94%           |         |             |                  |               |                               |   |               |            |            |  |
|         | 1,872.4      | 46.9  |            | 1:50/1.0<br>1:50/1.0                                     |               |               |         |             |                  |               |                               |   |               |            |            |  |
| 1870    |              |       | 5.0        | 2:11/1.0<br>2:21/1.0                                     | (5.0)<br>100% | (5.0)<br>100% | RS-8    |             |                  |               |                               |   |               |            |            |  |
|         |              |       |            | 2:17/1.0<br>2:30/1.0                                     |               |               | NO-0    |             |                  |               |                               |   |               |            |            |  |
|         | 1,867.4      | 51.9  |            | 2:20/1.0   |               |               |         |             |                  |               | - 1,867.4 Boring Terminated a | at Elevation 1,867.4 ft In Crysta   | alline Rock:  | GNEISS     | 51.9       |  |
|         | <u>.</u>     |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         | _            |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         | -            |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         | -            |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         | _            |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         | _            |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         | -            |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         |              |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         |              |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         |              |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         | _            | -     |            |  |               |               |         |             |                  |               | -                             |   |               |            |            |  |
|         |              |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         | -            | _     |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         |              |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         | _            |       |            |  |               |               |         |             |                  |               | •                             |   |               |            |            |  |
|         | -            |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         |              |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         | -            |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         |              |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         | -            |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         | -            |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         |              |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         | _            |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         |              |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         |              |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         | _            |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         | 1            |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         |              |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         | -            |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         |              |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |
|         |              |       |            |  |               |               |         |             |                  |               |                               |   |               |            |            |  |

SHEET

TIP B-3868 COUNTY: MACON GEOLOGIST Elliott, D. C. WBS 33313.1.1 SITE DESCRIPTION Bridge No. 172 on SR 1456 (Rose Creek Road) over Little Tennessee River GROUND WTR (ft) BORING NO. EB2-A STATION 19+86 OFFSET 14 ft LT ALIGNMENT -L-0 HR. N/A COLLAR ELEV. 1,930.2 ft TOTAL DEPTH 45.2 ft **NORTHING** 583,727 **EASTING** 675.186 24 HR. N/A DRILL RIG/HAMMER EFF./DATE AFO0070 CME-550X 81% 09/03/2009 DRILL METHOD NW Casing w/ SPT HAMMER TYPE Automatic DRILLER Cheek, D. O. START DATE 03/06/14 COMP. DATE 03/06/14 SURFACE WATER DEPTH N/A ELEV DRIVE DEPTH BLOW COUNT SAMP. **BLOWS PER FOOT** SOIL AND ROCK DESCRIPTION (ft) (ft) 0.5ft 0.5ft 0.5ft 75 100 MOI G NO. (ft) 1935 **GROUND SURFACE** 1930 ALLUVIAL
Brown-gray silty fine SAND . . . . 1925 1,925.0 5.2 11 ALLUVIAL GRAVEL 1920 1,920 0 10.2 SAPROLITE Brown-gray-black-orange garnetiferous silty SAND 1915 1,915.0 15.2 1910 1,910.0 20.2 4 . . . . 1905 1,905.0 25.2 1900 1,900.0 30.2 5 6 WEATHERED ROCK 1895 1,895.0 35.2 (seam of gneiss) SAPROLITE Brown-gray-black-orange garnetiferous silty SAND WEATHERED ROCK 1890 1,890 0 40.2 13 36 64/0.1 (gneiss) 100/0.6 . . . . :::: . . . . 1885 1,885 0 45.2 CRYSTALLINE ROCK Biotite GNEISS Boring Terminated with Standard Penetration Test Refusal at Elevation 1,885.0 ft In Crystalline Rock: GNEISS

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SHEET

| <b>NBS</b> | 33313         | 3.1.1               |              |        | Т      | IP B     | -3868          |          | COUNT     | Y MA         | CON    |          |            |          | GEOLOGIST Elliott, D                   | . C.                    |                        |           |
|------------|---------------|---------------------|--------------|--------|--------|----------|----------------|----------|-----------|--------------|--------|----------|------------|----------|--|-------------------------|------------------------|-----------|
| SITE       | DESCR         | IPTIO               | N Brid       | dge No | . 172  | on SF    | R 1456         | (Rose    | Creek Roa | d) ove       | Little | Tennes   | see R      | iver     |  |                         | GROUNI                 | D WTR (fi |
| 3OR        | NG NO.        | EB2                 | -B           |        | s      | TATIO    | ON 19          | 9+86     |           | OFF          | SET    | 14 ft RT |            |          | ALIGNMENT -L-                          |                         | 0 HR.                  | N/A       |
| OLI        | AR ELI        | EV. 1               | ,931.4       | ft     | T      | OTAL     | DEPT           | H 35.0   | ) ft      | NOR          | THING  | 583,     | 702        |          | <b>EASTING</b> 675,198                 |                         | 24 HR.                 | 7.8       |
| RILL       | RIG/HAI       | MMER E              | FF./DA       | TE AF  | -00070 | CME-     | 550X 8         | 1% 09/03 | 3/2009    |              |        | DRILL    | METHO      | D N      | W Casing W/SPT & Core                  | HAMM                    | ER TYPE                | Automatic |
| RIL        | LER C         | heek,               | D. O.        |        | S      | TART     | DATE           | 03/05    | /14       | COM          | P. DA  | TE 03/   | 05/14      |          | SURFACE WATER DEF                      |                         |                        |           |
| LEV        | DRIVE<br>ELEV | DEPTH               | BLC          | ow co  | UNT    |          |                | BLOW     | S PER FOO | Г            |        | SAMP.    | <b>V</b> / |          | COUL AND DO                            | OK DEOK                 | DIDTION                |           |
| (ft)       | (ft)          | (ft)                | 0.5ft        | 0.5ft  | 0.5ft  | 0        | 2              | 25       | 50        | 75           | 100    | NO.      | MO         | 0<br>  G | SOIL AND RO<br>ELEV. (ft)              | CK DESC                 | RIPTION                | DEPTH     |
|            |               |                     |              |        |        |          |                |          |           |              |        |          |            |          |  |                         |                        |           |
| 935        |               |                     |              |        |        |          |                |          |           |              |        |          |            |          |  |                         |                        |           |
|            | -             |                     |              | 4.5    |        |          |                |          |           |              |        |          |            |          |  |                         |                        |           |
| 20         | -             |                     | <del> </del> |        |        | H        |                |          |           |              |        |          |            | 220      |  | D SURFA                 | CE                     |           |
| 930        | -             | -                   |              | -      |        |          | <u> </u>       |          |           |              |        |          |            |          | Brown-tan-gra                          |                         | e SAND                 |           |
|            | -<br>1,926.4  | 5.0                 |              | 2      |        | :        | : <u> </u> : : |          | : : : :   | : :          | ::     |          |            |          |  |                         |                        |           |
| 25         | -,420.4       | -                   | 15           | 9      | 5      |          | •14_           |          |           |              |        |          |            |          | 1 924 5                                |                         |                        |           |
|            | -             | -                   |              |        |        |          |                |          |           |              |        |          |            | 500      |  | UVIAL                   | 1.50                   |           |
| -          | 1,921.4       | 10.0                | 7            | 7      | 9      | •        |                |          |           |              |        |          |            |          | GRAVEL SAP                             | & COBB<br>ROLITE        | LES:                   |           |
| 20         | -1            | -                   | '            | 7      | Э      | ŀ        | <b>9</b> 16_   |          |           | +            |        |          |            |          | Tan-orange-                            |                         | SAND                   |           |
|            | - 1           |                     |              |        |        | :        |                |          |           |              |        |          |            |          |  |                         |                        |           |
| 15         | 1,916.4       | 15.0                | 7            | 5      | 7      |          | 1              | :::      |           |              |        |          |            |          |  |                         |                        |           |
|            | 7             | _                   |              | 2      |        |          | Ť              |          |           | 1            |        |          |            |          |  |                         |                        |           |
|            | 1,911.4       | 20.0                |              |        |        | ::       |                |          |           |              | ::     |          |            |          |  |                         |                        |           |
| 10         | -             | -                   | 6            | 7      | 5      |          | 12             |          |           |              | • •    |          |            |          |  |                         |                        |           |
|            | ‡             |                     |              | -      |        | . :      | : ./           | -:-:-    |           | :-:          |        |          |            | 477      | 1,908.4<br>1,907.5 <b>WEATHE</b>       | RED RO                  | CK                     | 23        |
| 05         | 1,906.4       | 25.0                | 60/0.0       |        |        |          |                |          |           |              | 60/0.0 |          |            | 7        | (gi                                    | neiss)                  |                        |           |
| 05         | +             | -                   |              |        |        | <u> </u> |                |          |           | <del> </del> |        |          |            |          | CRYSTAI<br>QUARTZ&                     | Biotite GI              | NEISS                  |           |
|            | 1             |                     |              |        |        | . :      | ::             |          |           |              | ::     |          |            | 1        | Run 1: 25.0-30.0'<br>Run 2: 30.0-35.0' |                         |                        |           |
| 00         | 1             | -                   |              |        |        |          |                |          |           |              | • •    |          |            |          |  |                         |                        |           |
|            | 1             | -                   |              |        |        | :        | ::[            |          |           |              | ::     |          |            |          |  |                         |                        |           |
| -          |               | ·                   |              |        |        | <u></u>  | • •            | • • • •  |           | 1            |        |          |            |          | 1,896.4                                | 7 = 1 - 1               | 1000 15                | 3.        |
|            | 7             | -                   |              |        |        |          |                |          |           |              |        |          |            | F        | Boring Terminated a Crystalline F      | it Elevatio<br>Rock: GN | on 1,896.4 ff<br>√EISS | t In      |
|            | 1             |                     |              |        |        |          |                |          |           |              |        |          |            |          |  |                         |                        |           |
|            | 1             |                     |              |        |        |          |                |          |           |              |        |          |            | E        |  |                         |                        |           |
|            | 1             |                     |              |        |        |          |                |          |           |              |        |          |            | F        |  |                         |                        |           |
|            | -             |                     |              |        | . =    |          |                |          |           |              |        |          |            | F        |  |                         |                        |           |
|            | 7             |                     |              |        |        |          |                |          |           |              |        |          |            |          |  |                         |                        |           |
|            | ‡             |                     |              | -      |        |          |                |          |           |              |        |          |            |          |  |                         |                        |           |
|            | 1             |                     |              |        |        |          |                |          |           |              |        |          |            |          |  |                         |                        |           |
|            | +             |                     |              | n      |        |          |                |          |           |              |        |          |            |          |  |                         |                        |           |
|            | 1             |                     |              | 10 11  |        |          |                |          |           |              |        |          |            | Ŀ        |  |                         |                        |           |
|            | 1             |                     |              |        |        |          |                |          |           |              |        |          |            | F        |  |                         |                        |           |
|            | +             |                     |              | A 1    |        |          |                |          |           |              |        |          |            | F        |  |                         |                        |           |
|            | Ŧ             | 10 de 10<br>20 de 1 |              | 9- H   |        |          |                |          |           |              |        |          |            | F        |  |                         |                        |           |
|            | 1             |                     |              | - 3    |        |          |                |          |           |              |        |          |            |          |  |                         |                        |           |
|            | ‡             |                     |              |        |        |          |                | •        |           |              |        |          |            | E        |  |                         |                        |           |
|            | 1             |                     |              |        |        |          |                |          |           |              |        |          |            | -        |  |                         |                        |           |
|            | $\pm$         |                     |              |        |        |          |                |          | •         |              |        |          |            | -        |  |                         |                        |           |
|            | 1             |                     |              |        |        |          |                |          |           |              |        |          |            | F        |  |                         |                        |           |
|            | +             |                     |              |        |        |          |                |          |           |              |        |          |            | F        |  |                         |                        |           |
|            | 7             |                     |              |        |        |          |                |          |           |              |        |          |            | -        |  |                         |                        |           |
|            | ‡             |                     |              |        |        |          |                |          |           |              |        |          |            |          |  |                         |                        |           |
|            | +             |                     |              |        |        |          |                |          |           |              |        |          |            | -        |  |                         |                        |           |

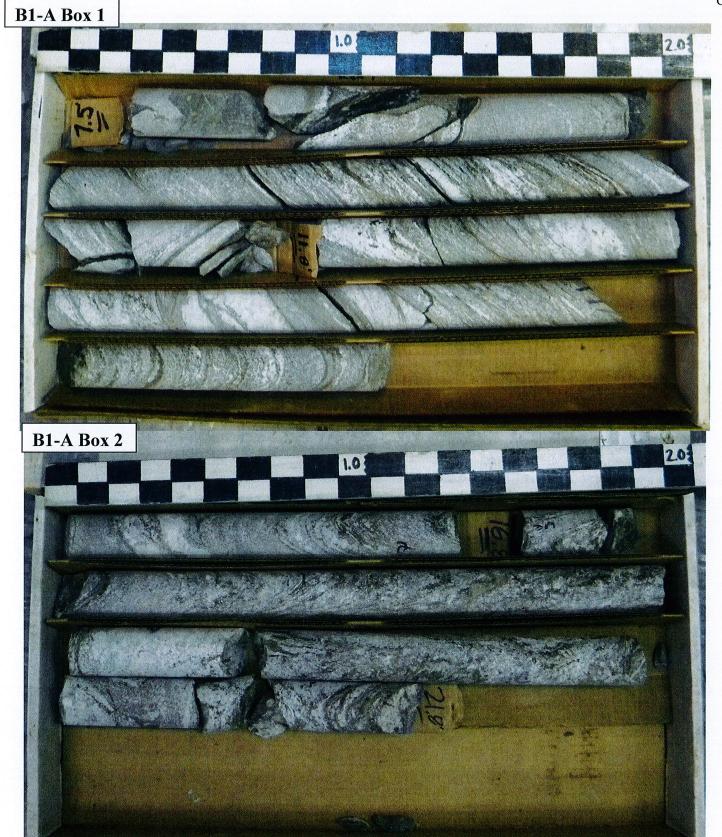


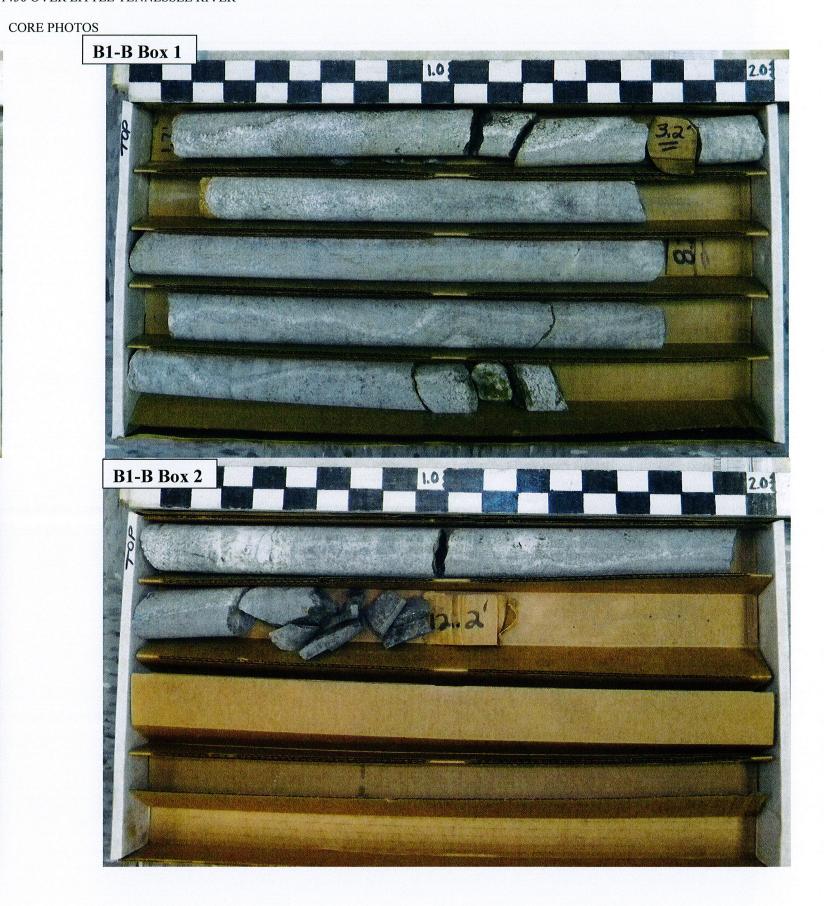
SHEET 120F15

| VA/DC  | 33313                          | 111              |             |                           | TID               | B-386            | 20           |              | OLINIT           | V P         | MACCAL                              | CEOLOGICE FILLS                                   |          |           |            |  |  |  |  |  |  |
|--|--------------------------------|------------------|-------------|---------------------------|-------------------|------------------|--------------|--------------|------------------|-------------|-------------------------------------|---|----------|-----------|------------|--|--|--|--|--|--|
|  |                                |                  | l Prio      | lao No. 1                 |                   |                  |              |              |                  |             | WACON<br>ver Little Tennessee River | GEOLOGIST Elliott, D.                             | . C.     | CPOLIN    | D WTR (ft) |  |  |  |  |  |  |
|  |                                |                  |             | ge No. 1                  |                   |                  |              | Creei        | Road             |             |                                     | ALICABREAUT                                       |          | 2019      |            |  |  |  |  |  |  |
| BORING NO.         EB2-B         STATION         19+86           COLLAR ELEV.         1,931.4 ft         TOTAL DEPTH         35.0 ft |                                |                  |             |                           |                   |                  |              |              |                  | +           | FSET 14 ft RT                       | ALIGNMENT -L-                                     | 0 HR.    | N/A       |            |  |  |  |  |  |  |
|  |                                |                  |             |                           |                   |                  |              |              |                  | NC          | DRTHING 583,702                     | <b>EASTING</b> 675,198                            |          | 24 HR.    | 7.8        |  |  |  |  |  |  |
|  | The Control of the Control     |                  |             | TE AFO0                   |                   |                  |              |              |                  |             |                                     | Casing W/SPT & Core                               | L        |           | Automatic  |  |  |  |  |  |  |
|  | LER C                          |                  |             |                           | Landa Control     |                  | TE 03/0      |              |                  | CC          | OMP. DATE 03/05/14                  | SURFACE WATER DEP                                 | TH N/    | 4         |            |  |  |  |  |  |  |
| COR  | ESIZE                          |                  |             |                           | AND THE PROPERTY. | AL RU<br>JN      | N 10.01      |              | ATA              |             |                                     |   |          |           |            |  |  |  |  |  |  |
| (ft)   | RUN<br>ELEV<br>(ft)            | DEPTH<br>(ft)    | RUN<br>(ft) | DRILL<br>RATE<br>(Min/ft) | REC.<br>(ft)      | RQD<br>(ft)<br>% | SAMP.<br>NO. | REC.<br>(ft) | RQD<br>(ft)<br>% | L<br>O<br>G | ELEV. (ft)                          | ESCRIPTION AND REMARKS                            | 3        |           | DEPTH (ft) |  |  |  |  |  |  |
| 906.43   | 4 000 4                        | - OF O           |             |                           |                   |                  |              |              |                  |             |                                     | Begin Coring @ 25.0 ft                            |          |           |            |  |  |  |  |  |  |
| 1905   | 1,906.4-<br>-<br>-<br>1,901.4- | -                | 5.0         | N=60/0.0                  | (1.8)<br>36%      | (0.0)            |              |              |                  |             | Recovered rock i                    | CRYSTALLINE ROCK<br>s Quartz in Run 1 & Gneiss in | Run 2 (c | ontinued) |            |  |  |  |  |  |  |
| 1900   | -<br>1,896.4-                  | -<br>-<br>- 35.0 | 0.0         |                           | (0.5)<br>10%      | 0%               |              |              |                  |             | -<br>-<br>- 1,896.4                 |   |          |           | 35.0       |  |  |  |  |  |  |
|  | 1,090.4-                       | 33.0             |             |                           |                   |                  |              |              |                  |             | Boring Terminated                   | at Elevation 1,896.4 ft In Cryst                  |          |           |            |  |  |  |  |  |  |

33313.1.1 (B-3868) MACON COUNTY BRIDGE # 172 ON SR 1456 OVER LITTLE TENNESSEE RIVER

CORE





#### 33313.1.1 (B-3868) MACON COUNTY BRIDGE # 172 ON SR 1456 OVER LITTLE TENNESSEE RIVER

**CORE PHOTOS** 



33313.1.1 (B-3868) MACON COUNTY BRIDGE # 172 ON SR 1456 OVER LITTLE TENNESSEE RIVER

CORE PHOTOS

