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76 3 38. PROJECT

4462 Ŕ REFERENCE

DESCRIPTION TITLE SHEET LEGEND SITE PLAN BORE LOGS

CONTENTS

SHEET NO.

2

3

4-5

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT**

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY <u>Cherokee</u>

PROJECT DESCRIPTION <u>Replace bridge number 148</u> on SR 1127 over Persimmon Creek

SITE DESCRIPTION ____

STATE N.C.

5



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 VARIOUS FIELD BORING LOGS, ROCK CORES AND SOLI TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1991 707-6800. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOLI 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 BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU UNPLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOLI MOISTURE CONDITIONS INCLATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOLI MOISTURE CONDITIONS MAY YARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE VIBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS SHOWN ON THE SUBSURFACE PLANS ARE DESIGN INFORMATION ON THIS PROJECT. THE DEPATIMENT DOES NOT WARRANT OR GUARANTEE THE DESIGN INFORMATION ON THIS PROJECT. THE DEPATIMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPNION OF THE DEPARTMENT AS TO THE TYPE MATERIAL SAND CONSTRUCTION STO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISTY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDENSATIONS FOR ANY EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTES:

- TES: THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR STEMENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
- 2.

PERSONNEL								
T. Evans (Falcon)								
S. Gower (Trigon)								
W. Trapp (Trigon)								
_								
INVESTIGATED BY								
DRAWN BY DMM								
CHECKED BY JCK								
SUBMITTED BY								
DATE6.16.2016								
DocuSigned by: D. Matthew Mullen 6/21/2016								
18909BD3GB544URE DATE								
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED								

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION

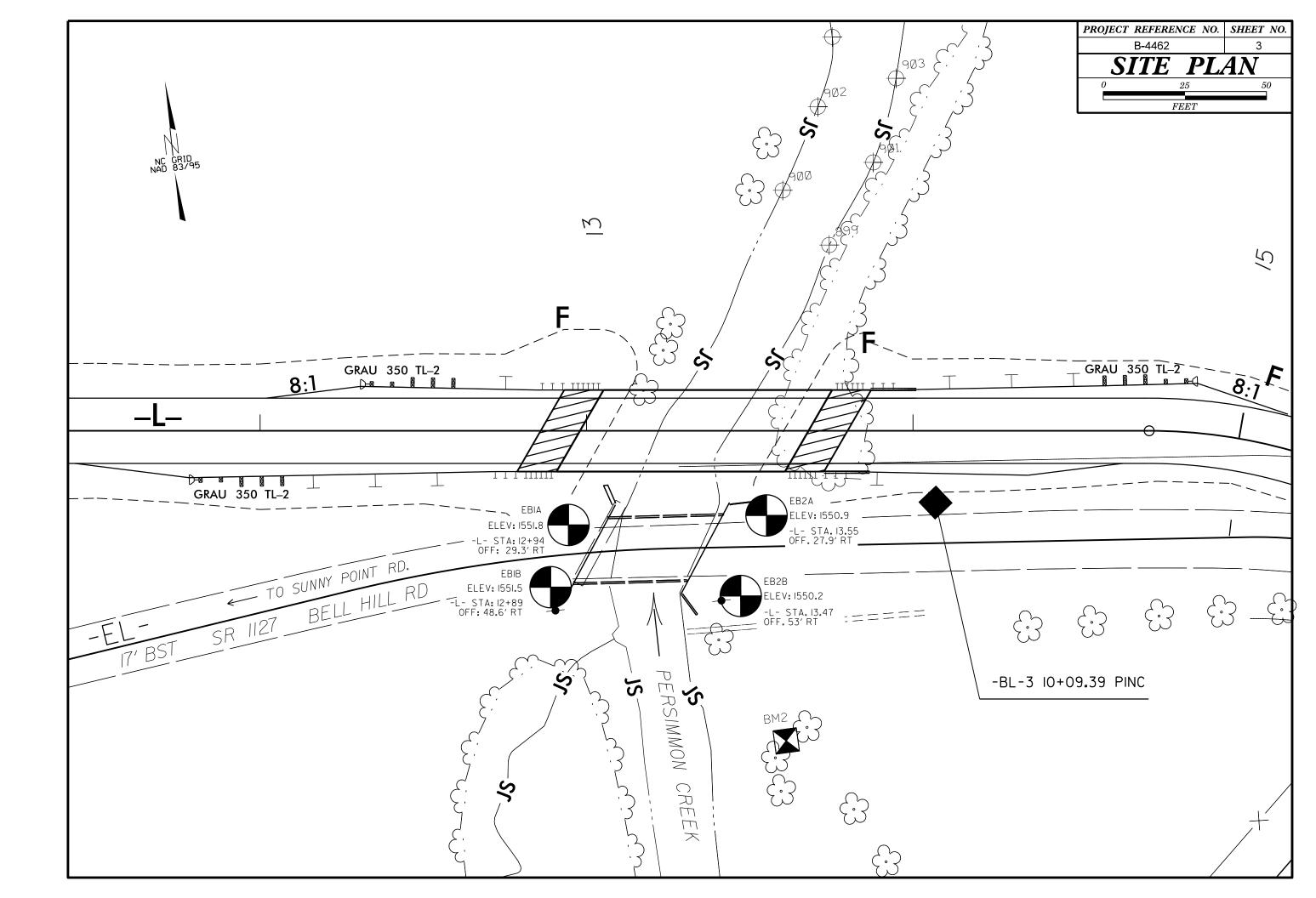
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS			
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.			
BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION	UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EOUAL TO OR LESS THAN 0.1 FOOT PER 60	AQUIFER - A WATER BEARING FORMATION OR STRATA.			
IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY OF GRAINS	BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.			
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING			
VERY STIFF.GRAY.SULTY CLAY,MOIST WITH INTERBEDDED FINE SAND LAYERS,HIGHLY PLASTIC,A-7-6 SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > ROCK (WR) 100 BLOWS PER FOOT IF TESTED.	A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT			
GENERAL GRANILLAR MATERIALS SILT-CLAY MATERIALS	MINERALOGICAL COMPOSITION	THE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE LEVEL HI			
CLASS. (≤ 35% PASSING 200) (> 35% PASSING 200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	CRYSTALLINE ROCK (CR) WOULD YELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, CNEISS, GABBRO, SCHIST, ETC.	SURFACE.			
CROUP 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-2-5 A-2-6 A-2-7 A-2 A-3 A-6, A-7	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.			
CLHSS. A-1-8 A-1-6 A-2-4 A-2-5 A-2-6 A-2-7 A-7.6 H-3 H-6 H-7	SLIGHTLY COMPRESSIBLE LL < 31	ROCK (NCR) SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.			
SYMBOL	MODERATELY COMPRESSIBLE LL = 31 - 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK SANDSTONE, CEMENTED	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED			
7. PASSING 10 50 MX GRANULAR SILT- GRANULAR SILT- MUCK,	HIGHLY COMPRESSIBLE LL > 50 PERCENTAGE OF MATERIAL	(CP) SHELL BEDS, ETC.	BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.			
*40 30 MX 50 MX 51 MN SOILS SOILS SOILS SOILS	GRANULAR SILT - CLAY	WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.			
- 2010 13 MA 23 MA 13 MA 33 MA 33 MA 35 MA 36 MM 36 MM 36 MM	ORGANIC MATERIAL SOILS OTHER MATERIAL 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			
MATERIAL PASSING #40	LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	HORIZONTAL.			
LL – – 40 MX 41 MN	MODERATELY ORGANIC 5 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	(V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.			
PI 6 MX NP 18 MX 18 MX 11 MN 11 MN 18 MX 18 MX 11 MN 11 MN 10 MX 11 MN 11 MN 11 MN 10 MX 1		OF A CRYSTALLINE NATURE.	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE			
USUAL TYPES STONE EPACE	₩ATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO (SLI.) 1 INCH, OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.			
OF MAJOR GRAVEL, AND SAND CRAVEL AND SAND SOTILS SOTILS		CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.			
MATEMIALS SANU	STATIC WATER LEVEL AFTER <u>24</u> HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN (MOD.) 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 PARENT MATERIAL.			
GEN.RATING EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITAG		DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.			
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ;PI OF A-7-6 SUBGROUP IS > LL - 30	- O-M- Spring or seep	WITH FRESH ROCK.	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE			
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH	FIELD.			
COMPACTNESS OF RANGE OF STANDARD RANGE OF UNCONFINED		(MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES 'CLUNK' SOUND WHEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.			
PRIMARY SOIL TYPE CONFIGURESS OR PENETRATION RESISTENCE COMPRESSIVE STRENGTH CONSISTENCY (N-VALUE) (TONS/FT ²)	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION WITH SOIL DESCRIPTION OF ROCK STRUCTURES	IF TESTED, WOULD YIELD SPT REFUSAL	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO			
		SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT (SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED	ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.			
GENERALLY LOOSE 4 TO 10	SUPE INDICATOR	TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES > 100 BPE</u>	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS			
MATERIAL MEDIUM DENSE 10 10 30 N/A	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT OF AUGER BORING ON CONE PENETROMETER TEST	VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.			
(NON-COHESIVE) VERY DENSE > 50		SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE			
VERY SOFT < 2 < 0.25	- INFERRED SOIL BOUNDARY - CORE BORING SOUNDING ROD	(V SEV.) REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</u>	OF AN INTERVENING IMPERVIOUS STRATUM.			
GENERALLY SOFT 2 TO 4 0.25 TO 0.5 SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0		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.			
MATERIAL STIFF 8 TO 15 1 TO 2		SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS	ROCK QUALITY DESIGNATION (RQD) - 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			
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4 HARD > 30 > 4	TTTTTT ALLUVIAL SOIL BOUNDARY	ALSO AN EXAMPLE.	RUN AND EXPRESSED AS A PERCENTAGE.			
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS		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	UNDERCUT UNCLASSIFIED EXCAVATION -	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REOUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND			
OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053		HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO			
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY SAND SAND SOLL CLAY	SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - EMBANKMENT OR BACKFILL	TO DETACH HAND SPECIMEN.	THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT			
(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)	ABBREVIATIONS	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	OR SLIP PLANE.			
GRAIN MM 305 75 2.0 0.25 0.05 0.005	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST	BY MODERATE BLOWS.	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF			
SIZE IN. 12 3	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED CL CLAY MOD MODERATELY γ - UNIT WEIGHT	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 I 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 A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL			
SOIL MOISTURE - CORRELATION OF TERMS	CPT - CONE PENETRATION TEST NP - NON PLASTIC $\dot{\gamma}_{ m d}$ - DRY UNIT WEIGHT	POINT OF A GEOLOGIST'S PICK.	TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.			
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	CSE COARSE ORG ORGANIC OMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS	SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.			
	DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.				
- SATURATED - USUALLY LIQUID: VERY WET, USUALLY (SAT.) FROM BELOW THE GROUND WATER TABLE	e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON F - FINE SL SILT, SILTY ST - SHELBY TUBE	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH	STRATA ROCK QUALITY DESIGNATION (SROD)- A MEASURE OF ROCK QUALITY DESCRIBED 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.			
	FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.			
PLASTIC SEMISOLID; REOUIRES DRYING TO	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL FRAGS FRAGMENTS w - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING				
	HI HIGHLY V - VERY RATIO	TERM SPACING TERM THICKNESS	BENCH MARK: BL-3			
	EQUIPMENT USED ON SUBJECT PROJECT	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	ELEVATION: 1549.8 FEET			
OM _ OPTIMUM MOISTURE SUCLES HT OK NEHK OF HOUSTOKE	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET	NOTES			
	CME-45C	CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET	NOTES:			
- DRY - (D) ATTAIN OPTIMUM MOISTURE	X CME-55 G* CONTINUOUS FLIGHT AUGER CORE SIZE:	THINLY LAMINATED < 0.008 FEET	-			
PLASTICITY	X 8* HOLLOW AUGERS	INDURATION				
PLASTICITY INDEX (PI) DRY STRENGTH	CME-550 HARD FACED FINGER BITS	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.				
NON PLASTIC 0-5 VERY LOW	U UNGCARBIDE INSERTS	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.				
SLIGHTLY PLASTIC 6-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM	AND TOOLS:	CRAINE CAN BE SERVED FROM CAMPLE VITU STEEL PROPE.				
HIGHLY PLASTIC 26 OR MORE HIGH		MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.				
COLOR		INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE;				
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).		DIFFICULT TO BREAK WITH HAMMER.				
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-14			
		SHITELE DREMAS AURUSS URAINS.	DAIE: 8-13-14			

PROJECT REFERENCE NO. B-4462



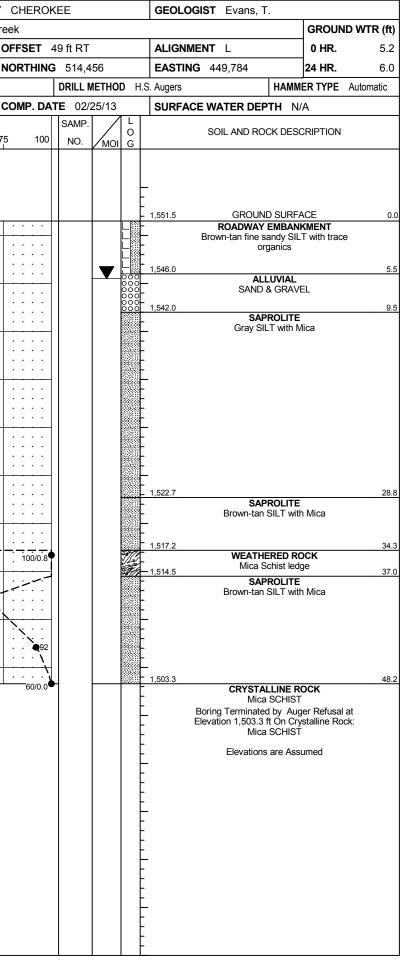
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GEOTECHNICAL BORING REPORT BORE LOG

										-00															
WBS	3 8376	6.1.2			1	IP B-446	62	COUNT	Y CHERO	KEE			GEOLO	GIST Evans, T.		WBS	3 837	6.1.2			ТІ	P B-4462		COUNT	Υ
SITE	DESCR	RIPTION	Brid	dge N	o. 148	on SR 11	27 over Pe	rsimmon	Creek						GROUND WTR (ft)	SITE DESCRIPTION Bridge No.). 148 c	on SR 1127	simmon	Cree			
BOR	ING NO	. EB1-	-A		S	STATION	12+94		OFFSET	29 ft RT	Г		ALIGN	MENT L	0 HR. 6.3	BOR	ING NO	. EB1	-В		ST	TATION 12	2+89		OF
COL	LAR EL	EV. 1,	551.8	ft	٦	OTAL DE	PTH 47.5	ft	NORTHIN	G 514,4	474		EASTI	IG 449,791	24 HR. FIAD	D COLLAR ELEV. 1,551.5 ft			тс	OTAL DEPT	ť	NC			
DRIL	L RIG/HA	MMER E	FF./DA	TE T	RI9435	CME-55 80	% 02/15/201	3	•	DRILL	METHO	D ⊦	H.S. Augers	HAMN	IER TYPE Automatic	DRIL	L RIG/HA	MMER E	EFF./DA	TE TI	RI9435 (CME-55 80%	02/15/2013	3	
DRIL	LER G	Gower, S	S.		5	TART DA	TE 02/26	/13	COMP. DA	TE 02/	/26/13		SURFA	CE WATER DEPTH N	/A	DRIL	LER G	Gower,	S.		ST	TART DATE	E 02/25/1	13	CC
ELEV	DRIVE	DEPTH	BLO	ow co	DUNT		BLOWS	PER FOO	T	SAMP.	. 💙/	L				ELEV	DRIVE	DEPTH	BLC	ow co	UNT		BLOWS	PER FOO	Г
(ft)	ELEV (ft)	(ft)		0.5ft	0.5ft	0	25	50	75 100	NO.	мо	O I G	ELEV. (ft)	SOIL AND ROCK DES	DEPTH (ft)	(ft)	ELEV (ft)	(ft)		0.5ft	0.5ft	0 2	25 8	50 I	75 I
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	1,550.8	<u> </u> 1.0				<u> </u>							1,551.8	GROUND SURF. ROADWAY EMBAN				<u> </u>				H	<u> </u>		
1550		ł	6	6	9		5							Brown-tan-gray fine sandy s gravel		1550	1,549.7	1.8	WOH	2	1	 	+		+
	1,548.0	3.8	2	2	1									graver			1,547.5	4.0	WOH		3	Q 3			
1545	1,545.8	<u> </u>	3	1	2						\square					1545	1,545.7	5.8	3	4	9	€ 5			
	1,543.0	Ŧ ₈₈			-	•3]			1,543.8	ALLUVIAL	8.0			8.8			Ŭ	13			
		+ 0.0	8	7	7		4	· · · · ·	· · · · · ·			000		SAND & GRAV	ÆL		1,542.7	+ 8.8	9	7	9	•••16			
1540		ŧ					· · · · ·		· · · · · ·	-		000	0 1,539.3		12.5	1540		ŧ					+ • • • •		
	1,538.0	13.8	9	11	10	_ ::: ` \	 						-	SAPROLITE Gray SILT with N			1,538.1	13.4	9	7	9				
1535		‡					$\left\{ \begin{array}{ccc} 1 & 1 & 2 & 1 \\ 1 & 1 & 1 & 2 \\ 1 & 1 & 1 & 2 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 &$	· · · · ·	· · · · · · · ·				8 -			1535		‡							•
1555	1 -	‡											8 <u>-</u>			1000	-	ŧ				! .	<u> </u>		. .
	1,533.0	$\frac{18.8}{4}$	4	7	24		· · · · ·	· · · · ·	· · · · · ·				9 -				1,532.5	<u>+ 19.0</u> +	6	6	9		· · · ·		•
1530		ŧ					· /· · ·									1530		‡				· · • •15	· · · ·		· ·
	1,528.0	23.8					:/:::										1.527.7	+ 23.8							- -
		ŧ	10	12	11		. 23		· · · · · ·								,	1	6	6	9	· · • • 15			· ·
1525	1 -	ł							<u></u>	-			1			1525		Ŧ					<u> </u>	+	-
	1,523.0	28.8	14	24	33								1,523.0	SAPROLITE	28.8		1,522.7	28.8	11	13	18				
1520		Ŧ						· • • • • •						Red-brown SILT wit		1520		Ŧ	''				•31 · ·		
	1,518.0	+								1					34.0		1 -	Ŧ							
	1,010.0	+ <u>33.0</u> +	41	39/0.3	3					•		1		WEATHERED R	OCK		1,517.7	<u>+ 33.8</u> +	16	38	62/0.3			- $ -$	
1515		ŧ					· · · ·		· · · · ·	<u> </u>			F	Gray-black-brown Mic	ca Schist	1515		ŧ				· · · ·			· _ ·
	1,513.3	<u>† 38.5</u>	100/0.4	4			· · · · ·			•							1,513.1	38.4	25	36	30				
1510		‡					· · · · ·	· · · · ·		!						1510		‡							⁶
	1 -	+ + 43.5								1			1,508.3		43.5	1310	1 -	+					<u> </u>		
	1,000.0	+	60/0.1	Г					00/0.1	•		P		CRYSTALLINE R Mica SCHIST	ROCK		1,508.1	+ 43.4 +	44	43	49		· · · ·	· · · ·	
1505	1.504.3	± 47.5										P	1,504.3	Milea Sci IIS	47.5	1505		±					· · · ·		· ·
	1,004.0	+	60/0.0)			1		60/0.0	₽			-	Boring Terminated by Aug levation 1,504.3 ft In Crysta	ger Refusal at		1,503.3	48.2	60/0.0						· ·
		ŧ											È '	SCHIST				±	00/0.0			1			
	-	ŧ											F	Elevations are Ass	sumed		-	Ŧ				1			
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SHEET



GEOTECHNICAL BORING REPORT BORE LOG

										URE	200															
WBS	38376	6.1.2			TI	I P B-44	62		COUNT	Y CHER	OKEE			GEOL	OGIST Evans, T.	1	WBS	3 8376	.1.2			T	P B-4462		COUNT	Υ
SITE	DESCR	IPTION	Bric	lge No					simmon (1						GROUND WTR (ft)					ge No		on SR 1127		simmon (Cre
BOR	NG NO.	EB2-	A		S	TATION	13+5	55		OFFSET	28 ft R	Г		ALIGN	MENT L	0 HR. 6.8	BOR	RING NO.	EB2-	·B		S	TATION 1	3+47		0
COL	AR ELI	EV. 1,9	550.9	ft	Т	OTAL DE	PTH	32.3 f	t	NORTHI	NG 514,	471		EASTI	NG 449,852	24 HR. FIAD	COLLAR ELEV. 1,550.2 ft			T (it	N				
DRILL	RIG/HA	MMER E	FF./DA	TE TR	RI9435	CME-55 8	0% 02	2/15/2013			DRILL	METHO	DD H	H.S. Augers	HAMM	ER TYPE Automatic	DRIL	L RIG/HAN	IMER E	FF./DA	TE TF	RI9435	CME-55 80%	02/15/2013	\$	
DRIL	LER G	iower, S	S.		S	TART DA	ATE (02/26/1	3	COMP. D	DATE 02	/26/13	3	SURF	ACE WATER DEPTH N/	'A	DRIL	LER Go	ower, S	S.		S	TART DATI	02/25 /	13	C
ELEV	DRIVE ELEV	DEPTH		ow co			E	BLOWS	PER FOOT	Г	SAMP	P. ▼/	L		SOIL AND ROCK DESC	CRIPTION	ELEV	DRIVE ELEV	DEPTH	BLO	w co	UNT		BLOWS	PER FOOT	r
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25 I	!	50	75 10	00 NO.	мс	DI G	ELEV. (ft)		DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75
1555		ł												F			1555		-							
	-	Į												E												
1550	1,549.9	1.0												1,550.9	GROUND SURFA		1550									
		+ 	3	3	2	∳ 5					.			<u></u>	Brown fine sandy SILT with	n minor gravel		1,548.5	1.7	2	1	2				
	1,547.2	Ī	8	3	4		· · ·							<u></u>				1,546.2	4.0	WOH			$\begin{array}{c c} \bullet 3 & \cdot & \cdot \\ \bullet & \bullet & \cdot \\ \bullet & \bullet & \cdot & \cdot \end{array}$			·
1545	1,545.1	5.8	2	1	WOH							\square		1,544.9	ALLUVIAL	6.0		1.543.3	-	WOIT	WOIT	Wo	¦+♥⁰		<u> </u>	
	1,542.2	8.7	6	10	13				000	1,542.9	Dark-gray silty CL ALLUVIAL	_AY8.0		1,543.3	•	1	2	3	●5	· · · ·		•
1540	-	+					.•23.	 					000		SAND & GRAVE	EL	1540		-	8	13	13		● 26 · · ·	· · ·	·
	1,537.1	+					<u>/: :</u>	· · · · ·			. .		000					‡					:::;			:
1535	1,537.1	13.8	4	5	6	<i>/</i> . ●11	· ·	· · · ·		· · · · ·	. .		000	5 <u>1,536.9</u>	SAPROLITE		1535	1,536.3	13.9	3	5	7		· · · · ·	· · · ·	•
1555	-	ł									.			-	Gray SILT with N	lica	1555		-		Ū		1 2 Q 12		+	
	1,532.4	18.5	5	6	7		· · ·	· · · · · · · ·		· · · · ·				- 1,532.4 -	SAPROLITE	18.5		1,531.6	18.6				:: <u>\</u> :			•
1530	-	ŧ				· · · ~ '	¹³	· · · ·						<u> </u>	Red-brown SILT with	h Mica	1530	4 4	-	6	9	11	•••••	20		· -
	1.527.1	23.8					N. I							<u>9</u> -					23.4							
1525	-1,027.1	- 20.0	6	11	15			 16		· · · · ·				<u></u>			1525	1,526.8	. 23.4	5	7	13				:
	-	ŧ					. [.							9 — 9-				1 7					i			
	1,522.1	28.8	8	6	17					· · · · · · · ·				_ _ 1,520.6		30.3		1,521.8	28.4	100/0.4						
1520	1.518.6	F											۶D	- 1,520.0 - 1,518.6	WEATHERED RO Mica Schist		1520		-							—
	1,516.0	<u> </u>	60/0.0							60/0	.0•			[[CRYSTALLINE R			1,516.8	33.4							
	-	E												E	Mica SCHIST Boring Terminated by Aug	jer Refusal at	1515			100/0.5						
	-	Ł												Ł	Elevation 1,518.6 ft On Cry Mica SCHIST	stalline Rock:										•
	-	ł												Ł	Elevations are Ass			1,511.8	38.4	60/0.1				· · · ·		
2	-	ŧ												F			1510	1,508.9	41.3						+	\pm
5	-	ŧ												Ę						60/0.0						
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SHEET

CHEROKEE		GEOLOGIST Evans, T.			
reek				GROUN	D WTR (ft)
OFFSET 53 ft RT		ALIGNMENT L		0 HR.	6.0
NORTHING 514,447		EASTING 449,841		24 HR.	FIAD
DRILL METHOD	HS	Augers	HAMME		Automatic
COMP. DATE 02/25/13		SURFACE WATER DEP			
1 1 4		SUN ACL WATER DEF		`	
	C C C C	SOIL AND ROC	CK DESCI	RIPTION	
		1,550.2 GROUNE ROADWAY I			0.0
	-	Brown fine sandy SI	LT with tr	ace orgar	nics
		1,544.2	UVIAL		6.0
		1,541.5 Brown-gray fine	to mediu	m SAND	8.7
		ALL	UVIAL & GRAVE	L	
		1,538.2 SAPI	ROLITE		12.0
		Gray SIL		са	
	÷.	1,531.6			18.6
	8E			Mico	
	E	Red-blowing		IVIICa	
	E				
		1,524.2			26.0
		WEATHE Red-browr			
- 100/0.4					
· 100/0.5					
		1,511.8 CRYSTAL		СК	38.4
		1,508.9	SCHIST		41.3
60/0.0	F	Boring Terminated Elevation 1,508.9 ft Ir SC	by Auge Crystallii HIST	er Refusal ne Rock:	at Mica
	F	Elevations	are Assu	med	
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