APPENDIX A BORING LOGS AND CORE PHOTOS

BORING LOGS

MWH	Project: NECR UNC JETTY GEOTECH INVESTIGATION Project Location: NECR JETTY Project Number: 1050	ROCK CORE LOGGING FORM	BOREHOLE No.: B1 Sheet 1 of 4

Drilling Company: NATIONAL EWP	Inclination: 90°	Groundwater Level & Date Measured							Start Date: 8-Nov-2016
Driller: MATT CAIN	Azimuth: —	Water Level:	NA						Finish Date: 8-Nov-2016
Drilling Method: ROTARY	Northing: 12 S 0725716 UTM	Date:	—						Total Depth: 32.1
Drilling Rig: CME85	Easting: 3947688 NAD83	Time:	—						Logged By: J. VANDPELT / S. DOUDOS
Drill Bit Type/Size: HQ/HQ3 (PDC)	Elevation: HANDHELD GPS	Casing Depth	NA						Checked By:

Depth / Elevation	Drill Time, 24-hr (Rate, ft/hr)	Run No.	Box No.	Recovery Driven / Recovered	RQD Total > 4-in. / Driven	Fractures / foot	Weathering	Strength	Lithology / Symbol	Material Description
0	13:30									SANDSTONE, pale yellow (2.5Y 7/4) to yellow (2.5Y 7/6), fine-grained, with occasional grayish red purple (5RP 4/2) intervals, fine- to medium-grained, moderately to slightly weathered w/ iron oxidation, weak to moderately strong, moderately hard, very thinly to thinly bedded, locally laminated, moderately jointed, predominantly along bedding
1						7				
2						1				
3		1	1	3.95/5.30' (75%)	3.07/5.30' (58%)	3	W3-W2	R2-R3, H4		-Bedding at 60° to core axis.
4										grayish red purple laminae banding
5	13:35					3				
	13:48					2		R2		
6								R0-R1		← Weak to very weak zone, crushed
						10				
7				5.00/5.00' (100%)	2.53/5.00' (51%)			R2		
						3		R0		
8		2	1				W2-W3	R2		
						5				
9								R0-R1		
						>10				← Coal stringers. Iron oxidation/weathering
10							W3			

Fracture Drawing Number	Dip / Core Axis	Type of Disc.	Width	Type of Infilling	Amount of Infilling	Surface Shape	Roughness	Spacing	Permeability	Remarks	Well Details
	NR										
	75	J	VN	Fe	Sp	Pl	SR				
	85	J	VN	Fe	Sp	Pl	S				
	90	J	VN	Fe, Mn	Sp	Pl	S				
	85	J	VN	Fe	Sp	Pl	S				
	65	J	VN	Fe, Mn	Sp	Pl	SR				
	85	J	VN	Mn, Fe	Sp/Pa	Pl	S				
	85	J	Vn	-	No	Pl	S				
	60	J	Vn	Mn Fe	Fi	Pl	Sr	c			
	60	J	Vn	Mn Fe	Fi	Pl	S	c			
	85	J	Vn	Fe	St	Pl	S				
	MB										
	90	J	Vn	No - No	No	Pl	S			B1-5.3-5.95 Sampled	
	BZ										
	60	J	N: VN	No	No	Pl	SR				
	90	J	Vn	Fe Mn	St	Pl	S				
	90	J	VN	Fe Mn	St	Pl	S				
	70	J	Vn	Mn Fe	ST	Pl	S				
	60	J	VN	Fe	St	Pl	S				
	70	J	VN	Fe	Sp	Pl	R				
	70	J	Vn	Fe Mn	Sp	Pl	S				
	80	J	Vn	No	No	Pl	S				
	90	J	Vn	No	No	Pl	S				
	90	J	VN	No	No	Pl	S				
	BZ			No	No						
	90	MB									

DISCONTINUITY TYPE	APERATURE	INFILLING TYPE	INFILLING AMOUNT	SHAPE	ROUGHNESS
F - Fault J - Joint (Discontinuity) Fz - Fractrue Zone S - Shear Sz - Shear Zone V - Vein Fo - Foliation B - Bedding Joint MB - Mechanical Break BZ - Broken Zone	Tight (T) 0 Very Narrow (Vn) <0.05" (<1.3 mm) Narrow (N) 0.05-0.1" (1.3 - 2.5 mm) Open (O) 0.1-0.5" (2.5 - 12.7 mm) Wide (W) >0.5" (>12.7 mm)	Bi - Biotite Cl - Clay Ca - Calcite Ch - Chlorite Ep - Epidote Fe - Iron Oxide Gy - Gypsum H - Healed Mn - Manganese My - Mylonite No - None Py - Pyrite Qz - Quartz Sd - Sand Si - Silt Un - Unknown	Clean (No) Stained (Su) Spotty (Sp) Partial Filled (Pa) Filled (Fi) Cemented (Cm)	Wa - Wavy Pl - Planer St - Stepped Ir - Irregular	Slickensided (Slk) Visual evidence of polishing, striations Smooth (S) Surface appears and feels smooth Slightly rough (Sr) Asperities are distinguishable and can be felt Rough (R) Asperities are clearly visible, some ridges evident, suface feels abrasive Very rough (Vr) Near-vertical ridges occur on surface

DISCONTINUITY SPACING		WEATHERING	STRENGTH	
Extremely Wide (EW)	>6 ft	Fresh (W1)	R0 Extremely weak	
Wide (W)	2 ft - 6 ft	Slightly (W2)	R1 Very weak	
Moderate (M)	8 in - 2 ft	Moderately (W3)	R2 Weak	
Close (C)	2.4 in - 8 in	Highly (W4)	R3 Moderately strong	
Very Close (VC)	0.75 in - 2.4 in	Decomposed or Completely (W5)	R4 Strong	
Extremely Close (Ex)	<0.75 in	Residual Soil (W6)	R5 Very Strong	
			R6 Extremely strong	

MWH	Project: GE/UNIC Project Location: Project Number:	ROCK CORE LOGGING FORM	BOREHOLE No.: B1 Sheet 2 of 4 :

Drilling Company: SEE INFO ON	Inclination:	Groundwater Level & Date Measured									Start Date:
Driller: FIRST PAGE	Azimuth:	Water Level:									Finish Date:
Drilling Method: OF LOG	Northing:	Date:									Total Depth:
Drilling Rig:	Easting:	Time:									Logged By:
Drill Bit Type/Size:	Elevation:	Casing Depth									Checked By:

Depth / Elevation	Drill Time, 24-hr (Rate, ft/hr)	Run No.	Box No.	Recovery Driven	Recovery Recovered	RQD Total > 4-in.	RQD Driven	Fractures / foot	Weathering	Strength	Lithology / Symbol	Material Description	Remarks	Well Details
10	13:53								W2					
	14:09							>10					¥ 0.5' of Run Recovered in Run #4	
11												SANDSTONE, grayish red (5R 4/2) to pale yellowish brown (10YR 6/2) fine to medium-grained Slightly to moderately weathered, moderately strong, moderately hard. sub-angular quartz grains locally iron oxidation discoloration yellowish brown (10YR 5/8) moderately fractured.		
								7	W2-W3	R2-R3				
12									W2-W3					
								6		R3		grades to very dark gray (N 3/0)		
13				(81%)		(41%)			W2-W3?	R1-R2				
		3	2	4.05/5.00'		2.05/5.00'		2		R0		Organic CLAYSTONE /coal Black (N 2.5/0), very fine grained (clay) medium to high plasticity		
14									W2-W3	R3-R2		grades to: ~14.0' Siltstone/claystone, light Brownish gray, very fine-grained Slightly weathered, (W2) Moderately strong to strong moderately soft to moderately hard, moderately to highly fractured, predominantly along bedding planes.		
15	14:15							2						
	~14:30												15.3 SWITCH TO HQ3 10' Barrell	
	15:09							5		R3		14.8' grades to SANDSTONE, pinkish white (7.5YR 8/2) very fine-grained to fine grained Slightly weathered, moderately strong		
16													B1-17.3-18.1	
								1						
17													B1-17.3-18.1 Sampled. (15.9-16.7)	
				(108%)		(74%)		4						
18									W2	R3				
		4	2	7.35/6.80'		5.00/6.80'		4				← 1-inch SILTSTONE, gray (7.5YR 5/1) grades coarser to medium grained.		
19			19.6'					7				grades finer to finer to fine-grained.		
			3									grades coarser to med-gr.		
20														

DISCONTINUITY DATA

Fracture Drawing Number	Dip / Core Axis	Type of Disc.	Width	Type of Infilling	Amount of Infilling	Surface Shape	Roughness	Spacing	Permeability
	BZ			No					
	NR								
	0	J	VN	No	No	Pl	S		
	50	J	VN	Fe	Sp	Pl	S		
	90	J	VN	No	No	Pl	S		
	90	J	VN	Fe	Sp	Pl	S		
	85	J	VN	Fe	Sp	Pl	S		
	30	J	VN	Fe	Fi	Pl	S		
	BZ								
	80	J	VN	Fe,Mn	Fi	Pl	S		
	90	J	N	FeMn	Pa	Pl	R		
	MB								
	MB	at contact							
	MB								
	90	J	VN	MnFe	Sp	Pl	Sm		
	90	J	VN	No	No	Pl	R		
	90	J	VN	Mn	Sp	Pl	S		
	BZ								
	MB			Mn.					
	80	J	VN	No	No	Pl	SR		
	BZ								
	90	J	Vn	MnMi	Sp	Pl	S		
	90	J	Vn	Mi	Sp	Pl	S		
	90	J	Vn	Mi	Sp	Pl	S		
	MB								
	90	J	VN	Mn,Mi	Fi	Pl	S		
	90	J	VN	MnMi	Fi	Pl	S		
	90	J	VN	Fe Mi	Sp	Pl	S		
	90	J	Vn	Fe,Mi	Sp	Pl	S		
	90	J	Vn	Mn					
	80	J	VN	Ca	Sp	Pl/St	R		
	90	J	Vn	Fe	Sp	Pl	S		
	90	J	Vn	Fe	Sp	Pl	S		
	90	J	Vn	No	No	Pl	S		
	80-90	J	VN	Fe,Mn Mi	Pa	Pl	S-SR		

DISCONTINUITY TYPE	APERATURE	INFILLING TYPE	INFILLING AMOUNT	SHAPE	ROUGHNESS	DISCONTINUITY SPACING	WEATHERING	STRENGTH
F - Fault J - Joint (Discontinuity) Fz - Fractrue Zone S - Shear Sz - Shear Zone V - Vein Fo - Foliation B - Bedding Joint MB - Mechanical Break BZ - Broken Zone	Tight (T) 0 Very Narrow (Vn) <0.05" (<1.3 mm) Narrow (N) 0.05-0.1" (1.3 - 2.5 mm) Open (O) 0.1-0.5" (2.5 - 12.7 mm) Wide (W) >0.5" (>12.7 mm)	Bi - Biotite Cl - Clay Ca - Calcite Ch - Chlorite Ep - Epidote Fe - Iron Oxide Gy - Gypsum H - Healed Mn - Manganese My - Mylonite No - None Py - Pyrite Qz - Quartz Sd - Sand Si - Silt Un - Unknown	Clean (No) Stained (Su) Spotty (Sp) Partial Filled (Pa) Filled (Fi) Cemented (Cm)	Wa - Wavy Pl - Planer St - Stepped Ir - Irregular	Slickensided (Slk) Visual evidence of polishing, striations Smooth (S) Surface appears and feels smooth Slightly rough (Sr) Asperities are distinguishable and can be felt Rough (R) Asperities are clearly visible, some ridges evident, suface feels abrasive Very rough (Vr) Near-vertical ridges occur on surface	Extremely Wide (EW) >6 ft Wide (W) 2 ft - 6 ft Moderate (M) 8 in - 2 ft Close (C) 2.4 in - 8 in Very Close (VC) 0.75-in - 2.4 in Extremely Close (Ex) <0.75 in	Fresh (W1) Slightly (W2) Moderately (W3) Highly (W4) Decomposed or Completely (W5) Residual Soil (W6)	R0 Extremely weak R1 Very weak R2 Weak R3 Moderately strong R4 Strong R5 Very Strong R6 Extremely strong

(Mi) = Mica

MWH	Project: GE/UNC NECR UNC JETTY Project Location: NORTHEAST CHURCH ROCK. Project Number:	ROCK CORE LOGGING FORM	BOREHOLE No.: B1 Sheet 3 of 4 :

Drilling Company: SEE INFO	Inclination:	Groundwater Level & Date Measured										Start Date:
Driller: ON FIRST PAGE	Azimuth:	Water Level:										Finish Date:
Drilling Method: OF LOG	Northing:	Date:										Total Depth:
Drilling Rig:	Easting:	Time:										Logged By:
Drill Bit Type/Size:	Elevation:	Casing Depth										Checked By:

Depth / Elevation	Drill Time, 24-hr (Rate, ft/hr)	Run No.	Box No.	Recovery Driven / Recovered	RQD Total > 4-in. / Driven	Fractures / foot	Weathering	Strength	Lithology / Symbol	Material Description
20										SANDSTONE, CONTINUED
						3				
21		4	3				W2	R3		Coal/organic clay stringers. grades finer to very fine-grained SANDSTONE/SILTSTONE. abundand coal/organic clay stringers throughout slightly weathered, moderately strong, moderately hard.
						4				
22	15:09									
						>10				
1334 23		5	3	(56%) 2.8/5.0	(14%) 0.7/5.0		W2	R3		
						4				
24										
						5				
25										← coal, lignite/ Bituminous.
						>10				
26										
						>10				
27										
	16:30					4	W2-W3	R2-R3		SILTSTONE/SANDSTONE, As above, fewer coal stringers, gray (7.5YR 6/1), very fine grained.
28		6	3	(110%) 5.50/5.00'	(60%) 3.00/5.00'	4	W2-W3	R2-R3		27.65 - 27.9 CLAY (CL) gray (7.5YR 6/1) weak to very weak/SOFT
29										Increasing coal stringers, concretions.
						3				
30										

DISCONTINUITY DATA

Fracture Drawing Number	Dip / Core Axis	Type of Disc.	Width	Type of Infilling	Amount of Infilling	Surface Shape	Roughness	Spacing	Permeability	Remarks	Well Details
	60	J	Vn	No	No	Pl	SR				
	MB 90	J	Vn	Mn Fe Mi	Pa	Pl	R				
	90	J/B	Vn	Cl (org) Mi	Fi	Pl	S				
	90 ↓	J/B	Vn	Mn/Fe	Fi	Pl	Sm				
	90	J/B	Vn	Coal/Cl	Fi	Pl	S				
	90	J/B	Vn	Coal/Cl	Fi	Pl	S				
	90	J/B	Vn	Coal/Cl Fe	Fi	Pl	S	VC			
	BZ	J/B	Vn	Coal/Cl	Fi	Pl	S				
	90	J/B	Vn	coal/Cl	Pa	Pl	S				
	90	J/B	Vn	coal/Cl	Fi	Pl	S				
	90 ↓	J/B	Vn	coal/Mi	Fi	Pl	S				
24	90	J/B	Vn	coal/mi	Fi	Pl	Sm				
	90	J/B	Vn	coal/Fe	Fi	Pl	S				
	90	J/B	Vn	coal/mi	Pa	Pl	S				
	90	J/B	Vn	coal/mi	Pa	Pl	S				
	90	C/B	Vn	coal Fe	Fi	Pl	S				
	NR										
	90	J	Vn	Fe,	Fi	Pl	SR				
	90	J	N	Fe	Fi	Pl	SR				
	90 90	BZ	Vn	Cl, Fe	Fi	Pl	S				
	90	J	Vn	Cl	Fi	Pl	S				
	80	J	Vn	Fe Mn Mi	Pl	SR					
	90	J	Vn	Fe Mi	Pl	SR					
	90	J	Vn	Fe Mi	Pl	S					
	90	J	Vn	Fe	Pa	S				B1 - 29.45 - 30.15 SAMPLED	

DISCONTINUITY TYPE	APERATURE	INFILLING TYPE	INFILLING AMOUNT	SHAPE	ROUGHNESS	DISCONTINUITY SPACING	WEATHERING	STRENGTH
F - Fault J - Joint (Discontinuity) Fz - Fractrue Zone S - Shear Sz - Shear Zone V - Vein Fo - Foliation B - Bedding Joint MB - Mechanical Break BZ - Broken Zone	Tight (T) 0 Very Narrow (Vn) <0.05" (<1.3 mm) Narrow (N) 0.05-0.1" (1.3 - 2.5 mm) Open (O) 0.1-0.5" (2.5 - 12.7 mm) Wide (W) >0.5" (>12.7 mm)	Bi - Biotite Cl - Clay Ca - Calcite Ch - Chlorite Ep - Epidote Fe - Iron Oxide Gy - Gypsum H - Healed Mn - Manganese My - Mylonite No - None Py - Pyrite Qz - Quartz Sd - Sand Si - Silt Un - Unknown	Clean (No) Stained (Su) Spotty (Sp) Partial Filled (Pa) Filled (Fi) Cemented (Cm)	Wa - Wavy Pl - Planer St - Stepped Ir - Irregular	Slickensided (Slk) Visual evidence of polishing, striations Smooth (S) Surface appears and feels smooth Slightly rough (Sr) Asperities are distinguishable and can be felt Rough (R) Asperities are clearly visible, some ridges evident, suface feels abrasive Very rough (Vr) Near-vertical ridges occur on surface	Extremely Wide (EW) >6 ft Wide (W) 2 ft - 6 ft Moderate (M) 8 in - 2 ft Close (C) 2.4 in - 8 in Very Close (VC) 0.75-in - 2.4 in Extremely Close (Ex) <0.75 in	Fresh (W1) Slightly (W2) Moderately (W3) Highly (W4) Decomposed or Completely (W5) Residual Soil (W6)	R0 Extremely weak R1 Very weak R2 Weak R3 Moderately strong R4 Strong R5 Very Strong R6 Extremely strong

MWH	Project: NECR UNR JETTY GEO TECH INVEST Project Location: Project Number:	ROCK CORE LOGGING FORM	BOREHOLE No.: B1 Sheet 3 of 4 :

Drilling Company: SEE INFO ON	Inclination:	Groundwater Level & Date Measured											Start Date:
Driller: FIRST PAGE	Azimuth:	Water Level:											Finish Date:
Drilling Method: OF LOG	Northing:	Date:											Total Depth:
Drilling Rig:	Easting:	Time:											Logged By:
Drill Bit Type/Size:	Elevation:	Casing Depth											Checked By:

Depth / Elevation	Drill Time, 24-hr (Rate, ft/hr)	Run No.	Box No.	Recovery Driven / Recovered	RQD Total > 4-in. / Driven	Fractures / foot	Weathering	Strength	Lithology / Symbol	Material Description	Fracture Drawing Number	Dip / Core Axis	Type of Disc.	Width	Type of Infilling	Amount of Infilling	Surface Shape	Roughness	Spacing	Permeability	Remarks	Well Details
30										- SILTSTONE/SANDSTONE, CONT.												
						1						MB										
												80	J	VN	Fe	Pa	Ir	SR				
31		6	4	5.50/5.00'	3.10/5.00'		W2-W3	R2-R3				80	J	VN	Fe, Mn	Pa	Pl/St	R				
						5						90	J	VN	Fe	Sp	Pl	S				
												90	J	VN	Mn Fe M.	Pa	Pl	S				
32	15.09											90	J	VN	Fe M. Mn	Pa	Ir/St	R				
	6912 El.									TOTAL DEPTH 32.10 feet Bgs												
33																						

DISCONTINUITY TYPE	APERATURE	INFILLING TYPE	INFILLING AMOUNT	SHAPE	ROUGHNESS	DISCONTINUITY SPACING	WEATHERING	STRENGTH
F - Fault J - Joint (Discontinuity) Fz - Fractrue Zone S - Shear Sz - Shear Zone V - Vein Fo - Foliation B - Bedding Joint MB - Mechanical Break BZ - Broken Zone	Tight (T) 0 Very Narrow (Vn) <0.05" (<1.3 mm) Narrow (N) 0.05-0.1" (1.3 - 2.5 mm) Open (O) 0.1-0.5" (2.5 - 12.7 mm) Wide (W) >0.5" (>12.7 mm)	Bi - Biotite Cl - Clay Ca - Calcite Ch - Chlorite Ep - Epidote Fe - Iron Oxide Gy - Gypsum H - Healed Mn - Manganese My - Mylonite No - None Py - Pyrite Qz - Quartz Sd - Sand Si - Silt Un - Unknown	Clean (No) Stained (Su) Spotty (Sp) Partial Filled (Pa) Filled (Fi) Cemented (Cm)	Wa - Wavy Pl - Planer St - Stepped Ir - Irregular	Slickensided (Slk) Visual evidence of polishing, striations Smooth (S) Surface appears and feels smooth Slightly rough (Sr) Asperities are distinguishable and can be felt Rough (R) Asperities are clearly visible, some ridges evident, suface feels abrasive Very rough (Vr) Near-vertical ridges occur on surface	Extremely Wide (EW) >6 ft Wide (W) 2 ft - 6 ft Moderate (M) 8 in - 2 ft Close (C) 2.4 in - 8 in Very Close (VC) 0.75-in - 2.4 in Extremely Close (Ex) <0.75 in	Fresh (W1) Slightly (W2) Moderately (W3) Highly (W4) Decomposed or Completely (W5) Residual Soil (W6)	R0 Extremely weak R1 Very weak R2 Weak R3 Moderately strong R4 Strong R5 Very Strong R6 Extremely strong

MWH	Client: GE/UNC NECK JETTY Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B2 Sheet 1 of 6

Drilling Company: National	Drilling Rig: CME-85	Bit Type: HSA SOIL	Start Date: 11/9/16
Drillers (day / night): M. Cain	Drilling Method: HSA	Logged by: S. DOWNEY / J. VANPELT	Finish Date: 11/9/16
Field Representitive (day / night): S. Downey	Core Diameter: 4" ID / 9" OD		Total Depth: 52.1

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
0					SP	Poorly graded sand (SP), brown (10 YR 5/3) to yellowish brown (10YR 5/4), very loose to loose; dry, predominantly fine sand, medium sand (10%), trace silt and clay, non cemented, angular to sub-angular quartz grains		Hand auger to 5 ft depth Began drilling @ 0915	
1									
2									
3									
4									
5	Mod-CAL 2" ID	3	6			As Above.		cal-mod	
		6	6						
6		11	6						
7									
8									
9									
10		6	6						

COARSE-GRAINED SOILS <50% passes #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines — GW
			Poorly-graded[2] gravels, gravel-sand mixtures, little or no fines — GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[2] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[2] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[1] sands, gravelly sands, little or no fines — SW
			Poorly-graded[2] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[2] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[2] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
			Organic silts and clays of medium to high plasticity — OH
	HIGHLY ORGANIC SOILS		Peat, humus, swamp soils with high organic content — PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = *140 pound hammer dropped 30 inches*

[1]Note:
Well-graded = poorly sorted
Poorly-graded = well sorted

PLASTICITY

Nonplastic	
Low	
Medium	
High	

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

Depth to first water (time and date)

Depth to water after drilling (time and date)

MWH	Client: GE/UNC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B2 Sheet 2 of 6

Drilling Company: National	Drilling Rig: CME-85	Bit Type: HSA	Start Date: 11/9/16
Drillers (day / night): M. Cain	Drilling Method: HSA	Logged by: S. Downey	Finish Date: 11/9/16
Field Representitive (day / night): S. Downey	Core Diameter:		Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
10	MOD-CAL 2" ID	6	6		SS	similar to above very fine-grained sand			
		7	6			10.7 ft. coarse sand-sized caliche nodules			
11									
12									
13									
14									
15	MOD-CAL 2" ID	6	6						
		12	6						
		30	6						
16						At 16 ft. moderate cementation/induration			
					SS	weathered bedrock at 16.5'		~16.5' driller notes possible bedrock	
17	MOD-CAL	50	3			Bedrock at 17.5' Sandstone, very pale brown (10YR 7/4) to yellow (10 YR 7/6), fine- to medium-grained, moderately to highly weathered with iron oxidation, weak to very weak, soft to moderately soft, very thinly bedded to laminated		- switch over to rock coring at 17.75', begin core logs	
18									
19						COMPLETE HOLLOW STEM AUGERING AT 18.1' bgs. SET HWT CASING TO CONTINUE DRILLING INTO BEDROCK. LOG CONTINUED ON NEXT PAGE			
20									

COARSE-GRAINED SOILS >50% passes #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[a] gravels, gravel-sand mixtures, little or no fines — GW
			Poorly-graded[a] gravels, gravel-sand mixtures, little or no fines — GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[a] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[a] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[a] sands, gravelly sands, little or no fines — SW
			Poorly-graded[a] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[a] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[a] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
			Organic silts and clays of medium to high plasticity — OH
HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content — PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below:

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

[a]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY: Nonplastic, Low, Medium, High

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

▽ Depth to first water (time and date)

▼ Depth to water after drilling (time and date)

MWH	Project: GE/UNC NECR Project Location: Church Rock, NM Project Number:	ROCK CORE LOGGING FORM	BOREHOLE No.: B2 Sheet 3 of 6 :

Drilling Company: National	Inclination: 90	Groundwater Level & Date Measured								Start Date: 11/9/16
Driller: M. Cain	Azimuth: —	Water Level:	NA							Finish Date: 11/9/2016
Drilling Method: Diamond Wireline	Northing: 12S 0725632 UTM	Date:	—							Total Depth: 52.1 feet
Drilling Rig: CME-85	Easting: 3947645 NAD83	Time:	—							Logged By: S. Downey / J. VAN PELT
Drill Bit Type/Size: PDC HQ	Elevation: Hand Held GPS	Casing Depth	18.1'							Checked By:

Depth / Elevation	Drill Time, 24-hr (Rate, ft/hr)	Run No.	Box No.	Recovery Driven / Recovered	RQD Total > 4-in. / Driven	Fractures / foot	Weathering	Strength	Lithology / Symbol	Material Description	Fracture Drawing Number	Dip / Core Axis	Type of Disc.	Width	Type of Infilling	Amount of Infilling	Surface Shape	Roughness	Spacing	Permeability	Remarks	Well Details
15																						
16																						
17																						
17.75'																						
18										LOG CONTINUED FROM PREVIOUS PAGE												
	1142					>10	W2-W3	R3		SANDSTONE, very pale brown (10YR 8/2) with reddish yellow (7.5YR 7/8) iron oxidation banding fine- to coarse-grained, coarsens downward slightly to moderately weathered, local Fe oxide, weak moderately strong, moderately hard, very thin to thickly bedded, w/ local cross-bedding. bedding at 80° to 60° to core axis Sub-angular quartz grains.		NR										
19						1	W3					85	BZ									
												90	J	Vn	Fe	Sp	Pl	SR				
												75	J	Vn	Fe, Mi	Sp	Pl	S				
													MB									
20		1	1	3.35/4.00 (84%)	2.65/4.00 (66%)	1							MB									
													MB									
												60	J/B	VN	Fe	Sp	Pl	S				
21						2	W2-W3				21	60	J/B	VN	Fe	Sp	Pl	S				
												80	J	VN	Fe	Pa	Pl/Sr	SR				
22	1116										22											
	1131 WELF					5				22.9-23.3 feet grades finer to medium to fine-grained. 23.3-26.0 Weakly cemented.		NR										
23		2	1	9.70/10.00 (97%)	8.90/10.00 (89%)	2	W2-3	R1-R2				80	J	VN	No	No	Pl	S				
												80	J	VN	Fe	Pa	Pl	S				
													MB									
24						1						60	J/B	VN	No	No	Pl	S				
												90										
													MB									
													MB									
													MB									
													MB									
25																						

DISCONTINUITY TYPE	APERATURE	INFILLING TYPE	INFILLING AMOUNT	SHAPE	ROUGHNESS	DISCONTINUITY SPACING	WEATHERING	STRENGTH
F - Fault J - Joint (Discontinuity) Fz - Fractrue Zone S - Shear Sz - Shear Zone V - Vein Fo - Foliation B - Bedding Joint MB - Mechanical Break BZ - Broken Zone	Tight (T) 0 Very Narrow (Vn) <0.05" (<1.3 mm) Narrow (N) 0.05-0.1" (1.3 - 2.5 mm) Open (O) 0.1-0.5" (2.5 - 12.7 mm) Wide (W) >0.5" (>12.7 mm)	Bi - Biotite Cl - Clay Ca - Calcite Ch - Chlorite Ep - Epidote Fe - Iron Oxide Gy - Gypsum H - Healed Mn - Manganese My - Mylonite No - None Py - Pyrite Qz - Quartz Sd - Sand Si - Silt Un - Unknown	Clean (No) Stained (Su) Spotty (Sp) Partial Filled (Pa) Filled (Fi) Cemented (Cm)	Wa - Wavy Pl - Planer St - Stepped Ir - Irregular	Slickensided (Slk) Visual evidence of polishing, striations Smooth (S) Surface appears and feels smooth Slightly rough (Sr) Asperities are distinguishable and can be felt Rough (R) Asperities are clearly visible, some ridges evident, suface feels abrasive Very rough (Vr) Near-vertical ridges occur on surface	Extremely Wide (EW) >6 ft Wide (W) 2 ft - 6 ft Moderate (M) 8 in - 2 ft Close (C) 2.4 in - 8 in Very Close (VC) 0.75 in - 2.4 in Extremely Close (Ex) <0.75 in	Fresh (W1) Slightly (W2) Moderately (W3) Highly (W4) Decomposed or Completely (W5) Residual Soil (W6)	R0 Extremely weak R1 Very weak R2 Weak R3 Moderately strong R4 Strong R5 Very Strong R6 Extremely strong

Mi - Mica

MWH	Project: GE/UNC Project Location: NECR Project Number:	ROCK CORE LOGGING FORM	BOREHOLE No.: B2 Sheet 4 of 6 :

Drilling Company: SEE INFORMATION	Inclination:	Groundwater Level & Date Measured								Start Date:
Driller: ON PAGE ONE OF	Azimuth:	Water Level:								Finish Date:
Drilling Method: LOG	Northing:	Date:								Total Depth:
Drilling Rig:	Easting:	Time:								Logged By:
Drill Bit Type/Size:	Elevation:	Casing Depth								Checked By:

Depth / Elevation	Drill Time, 24-hr (Rate, ft/hr)	Run No.	Box No.	Recovery Driven / Recovered	RQD Total > 4-in. / Driven	Fractures / foot	Weathering	Strength	Lithology / Symbol	Material Description
25						3		R1-R2		SANDSTONE, CONTINUED
26			1	(97%)	(89%)	0				26.0' grades finer
27						1				
28		2		9.70/10.0	8.90/10.0	0	W2-W3	R3		
29						0				
30			2			0				
31						1				
32	1144 1201 1224			(100%)	(92%)	1				
33		3		10.00'/10.00'	9.15'/10.00'	0	W2	R3-		
34						1		R1-R2		34.6 grades coarser.
35										

DISCONTINUITY DATA

Depth	Fracture Drawing Number	Dip / Core Axis	Type of Disc.	Width	Type of Infilling	Amount of Infilling	Surface Shape	Roughness	Spacing	Permeability
25			B2							
			MB							
			MB							
			MB							
26		MB								
27		80	J	N-Vn	Cl, Fe	Fi 2mm	Pl	S		
28										
29		MB								
30										
31										
32		85	J	Vn	Fe	Sp	Pl	S		
		MB								
		70	J/B	VN	No	No	Pl	S		
33										
34			MB							
			MB							
35		80	J	VN	clay/Fe	Sp	Pl	S		

Remarks	Well Details
B2-26.45-27.25 Sampled	
B2-30.25-31.1 Sampled	

DISCONTINUITY TYPE	APERATURE	INFILLING TYPE	INFILLING AMOUNT	SHAPE	ROUGHNESS	DISCONTINUITY SPACING	WEATHERING	STRENGTH
F - Fault J - Joint (Discontinuity) Fz - Fractrue Zone S - Shear Sz - Shear Zone V - Vein Fo - Foliation B - Bedding Joint MB - Mechanical Break BZ - Broken Zone	Tight (T) 0 Very Narrow (Vn) <0.05" (<1.3 mm) Narrow (N) 0.05-0.1" (1.3 - 2.5 mm) Open (O) 0.1-0.5" (2.5 - 12.7 mm) Wide (W) >0.5" (>12.7 mm)	Bi - Biotite, Mn - Manganese Cl - Clay, My - Mylonite Ca - Calcite, No - None Ch - Chlorite, Py - Pyrite Ep - Epidote, Qz - Quartz Fe - Iron Oxide, Sd - Sand Gy - Gypsum, Si - Silt H - Healed, Un - Unknown	Clean (No) Stained (Su) Spotty (Sp) Partial Filled (Pa) Filled (Fi) Cemented (Cm)	Wa - Wavy Pl - Planer St - Stepped Ir - Irregular	Slickensided (Slk) Visual evidence of polishing, striations Smooth (S) Surface appears and feels smooth Slightly rough (Sr) Asperities are distinguishable and can be felt Rough (R) Asperities are clearly visible, some ridges evident, suface feels abrasive Very rough (Vr) Near-vertical ridges occur on surface	Extremely Wide (EW) >6 ft Wide (W) 2 ft - 6 ft Moderate (M) 8 in - 2 ft Close (C) 2.4 in - 8 in Very Close (VC) 0.75-in - 2.4 in Extremely Close (Ex) <0.75 in	Fresh (W1) Slightly (W2) Moderately (W3) Highly (W4) Decomposed or Completely (W5) Residual Soil (W6)	R0 Extremely weak R1 Very weak R2 Weak R3 Moderately strong R4 Strong R5 Very Strong R6 Extremely strong

MWH	Project: GE/UNC Project Location: NECR Project Number:	ROCK CORE LOGGING FORM	BOREHOLE No.: B2 Sheet 5 of 6 :

Drilling Company: SEE INFORMATION	Inclination:	Groundwater Level & Date Measured								Start Date:
Driller: ON FIRST PAGE OF	Azimuth:	Water Level:								Finish Date:
Drilling Method: LOG	Northing:	Date:								Total Depth:
Drilling Rig:	Easting:	Time:								Logged By:
Drill Bit Type/Size:	Elevation:	Casing Depth								Checked By:

Depth / Elevation	Drill Time, 24-hr (Rate, ft/hr)	Run No.	Box No.	Recovery Driven / Recovered	RQD Total > 4-in. / Driven	Fractures / foot	Weathering	Strength	Lithology / Symbol	Material Description	Fracture Drawing	Number	Dip / Core Axis	Type of Disc.	Width	Type of Infilling	Amount of Infilling	Surface Shape	Roughness	Spacing	Permeability	Remarks	Well Details
35										SANDSTONE, CONTINUED			80	J	VN	Coal	Pa	IR	R				
						3								MB									
36														MB									
						1	W2-W3	R2					80	J	VN	Coal	Pa	Pl	SR				
37			2	(97%)	(92%)					← coal xenoliths			60	J	VN	No	No	Pl	S				
						1								MB									
38		3		9.70/10.00	9.15/10.00	0																Return water color change to black @ 38.3'	
39										COAL & ORGANIC CLAY, black (N 2.5/0) to brown (7.5YR 5/2) very fine grained/clayey, very soft to soft, locally anthracitic				MB								Abrupt change from sandstone to coal @ 38.83'	
						0																	
40			3																				
						0		R2		CLAYSTONE/SANDSTONE, brown (7.5YR 5/2) interbedded fine to very fine sand slightly to moderately weathered weak, moderately hard, slightly to moderately jointed. preferentially along bedding planes. laminated to thinly bedded				MB									
41						1							80	J	VN	Feel	Pa	Pl	S				
42	1224 1237 1304												NR									B2-42.0-42.5 Sampled	
						4																	
43				(98%)	(73%)			R2															
						2	W2	1021		43.5-43.65' very soft clay			80	J/B	N	Cl	Fi	Pl	S				
		4	3										80	J/B	Vn	Cl	Fi	Pl	S				
44				9.75/10.00	7.25/10.00																		
						1		R2															
45													60	J	Vn	Fe	Su	Pl	S				

DISCONTINUITY TYPE	APERATURE	INFILLING TYPE	INFILLING AMOUNT	SHAPE	ROUGHNESS	DISCONTINUITY SPACING	WEATHERING	STRENGTH
F - Fault J - Joint (Discontinuity) Fz - Fractrue Zone S - Shear Sz - Shear Zone V - Vein Fo - Foliation B - Bedding Joint MB - Mechanical Break BZ - Broken Zone	Tight (T) 0 Very Narrow (Vn) <0.05" (<1.3 mm) Narrow (N) 0.05-0.1" (1.3 - 2.5 mm) Open (O) 0.1-0.5" (2.5 - 12.7 mm) Wide (W) >0.5" (>12.7 mm)	Bi - Biotite Cl - Clay Ca - Calcite Ch - Chlorite Ep - Epidote Fe - Iron Oxide Gy - Gypsum H - Healed Mn - Manganese My - Mylonite No - None Py - Pyrite Qz - Quartz Sd - Sand Si - Silt Un - Unknown	Clean (No) Stained (Su) Spotty (Sp) Partial Filled (Pa) Filled (Fi) Cemented (Cm)	Wa - Wavy Pl - Planer St - Stepped Ir - Irregular	Slickensided (Slk) Visual evidence of polishing, striations Smooth (S) Surface appears and feels smooth Slightly rough (Sr) Asperities are distinguishable and can be felt Rough (R) Asperities are clearly visible, some ridges evident, suface feels abrasive Very rough (Vr) Near-vertical ridges occur on surface	Extremely Wide (EW) >6 ft Wide (W) 2 ft - 6 ft Moderate (M) 8 in - 2 ft Close (C) 2.4 in - 8 in Very Close (VC) 0.75-in - 2.4 in Extremely Close (Ex) <0.75 in	Fresh (W1) Slightly (W2) Moderately (W3) Highly (W4) Decomposed or Completely (W5) Residual Soil (W6)	R0 Extremely weak R1 Very weak R2 Weak R3 Moderately strong R4 Strong R5 Very Strong R6 Extremely strong

MWH	Project: GE/UNC Project Location: NECR Project Number:	ROCK CORE LOGGING FORM	BOREHOLE No.: B2 Sheet 6 of 6 :

Drilling Company: SEE INFORMATION	Inclination:	Groundwater Level & Date Measured								Start Date:
Driller: ON FIRST PAGE OF	Azimuth:	Water Level:								Finish Date:
Drilling Method: LOG	Northing:	Date:								Total Depth:
Drilling Rig:	Easting:	Time:								Logged By:
Drill Bit Type/Size:	Elevation:	Casing Depth								Checked By:

Depth / Elevation	Drill Time, 24-hr (Rate, ft/hr)	Run No.	Box No.	Recovery Driven / Recovered	RQD Total > 4-in. / Driven	Fractures / foot	Weathering	Strength	Lithology / Symbol	Material Description
45										CLAYSTONE/SILTSTONE cont.
46			3			0		R2		
47				(98%)	(73%)	4		R0/R1		
48		4		9.75/10.00	7.25'/10.00'	3	W2	R2		
49			4			4				grades to
50						3				Coal, black (N 2.5/0) Bituminous/Lignite brittle, moderately hard occasional very narrow veins of anhydrite and pyrite
51						5		R1, H4		
52	1304					3				grades to CLAYSTONE, as above
53										TOTAL DEPTH = 52.10 feet BGS
54										
55										

DISCONTINUITY DATA

Depth	Fracture Drawing	Number	Dip / Core Axis	Type of Disc.	Width	Type of Infilling	Amount of Infilling	Surface Shape	Roughness	Spacing	Permeability	Remarks	Well Details
46			85 MB	J/B	Vn	Cl	Fi	Pl	S				
47			80	J/B	Vn	Fe	Pa	Pl	S				
			80	J/B	Vn-N	Fe	Fi	Pl-Cu	Sr				
48			65	J	Vn	Fe	Fi	Pl	S				
			85	J	Vn	Gy	Pa	Pl	S				
			80	J	Vn	Fe	Pa	Pl	S				
49			70	J	Vn	Fe	Fi	Pl	S				
			75	J	Vn	Fe	Fi	Pl	S				
				MB									
			80	J	Vn	Fe	Fi	Pl	S				
50			70	J	Vn	Fe	Fi	IR	R				
				MB									
			BZ	BZ		Py Gy						Anhydrite	
51			70	J	Vn	Py Gy	Pa	ST	R				
			80	J	Vn	Fe	Pa	Pl	S				
			80	J	Vn	Fe	Pa	Pl	S				
				MB									
52													

DISCONTINUITY TYPE	APERATURE	INFILLING TYPE	INFILLING AMOUNT	SHAPE	ROUGHNESS	DISCONTINUITY SPACING	WEATHERING	STRENGTH
F - Fault J - Joint (Discontinuity) Fz - Fractrue Zone S - Shear Sz - Shear Zone V - Vein Fo - Foliation B - Bedding Joint MB - Mechanical Break BZ - Broken Zone	Tight (T) 0 Very Narrow (Vn) <0.05" (<1.3 mm) Narrow (N) 0.05-0.1" (1.3 - 2.5 mm) Open (O) 0.1-0.5" (2.5 - 12.7 mm) Wide (W) >0.5" (>12.7 mm)	Bi - Biotite Cl - Clay Ca - Calcite Ch - Chlorite Ep - Epidote Fe - Iron Oxide Gy - Gypsum H - Healed Mn - Manganese My - Mylonite No - None Py - Pyrite Qz - Quartz Sd - Sand Si - Silt Un - Unknown	Clean (No) Stained (Su) Spotty (Sp) Partial Filled (Pa) Filled (Fi) Cemented (Cm)	Wa - Wavy Pl - Planer St - Stepped Ir - Irregular	Slickensided (Slk) Visual evidence of polishing, striations Smooth (S) Surface appears and feels smooth Slightly rough (Sr) Asperities are distinguishable and can be felt Rough (R) Asperities are clearly visible, some ridges evident, suface feels abrasive Very rough (Vr) Near-vertical ridges occur on surface	Extremely Wide (EW) >6 ft Wide (W) 2 ft - 6 ft Moderate (M) 8 in - 2 ft Close (C) 2.4 in - 8 in Very Close (VC) 0.75-in - 2.4 in Extremely Close (Ex) <0.75 in	Fresh (W1) Slightly (W2) Moderately (W3) Highly (W4) Decomposed or Completely (W5) Residual Soil (W6)	R0 Extremely weak R1 Very weak R2 Weak R3 Moderately strong R4 Strong R5 Very Strong R6 Extremely strong

MWH	Client: GE/UNC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B3 Sheet 1 of 6

Drilling Company: National	Drilling Rig: CME-85	Bit Type: HSA/CME	Start Date: 11/9/16
Drillers (day / night): M. Cain	Drilling Method: HSA	Logged by: S. Downey / J. Van Pelt	Finish Date: 11/10/2016
Field Representitive (day / night): S. Downey	Core Diameter: HSA-9" / HQ3		Total Depth: 51.4 feet

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
0					SP	poorly graded sand (SP), yellowish brown (10YR 5/4), very loose to loose, predominantly fine sand, medium sand (20%-30%), trace silt and clay, small roots throughout		Hand auger top 5 ft Begin 14:57	
1									
2									
3									
4									
5	MOD-CAL 2" ID	4	6		SP				
		4	6						
6		6	6						
7									
8									
9									
10	NC 2" ID	5	6		SP				

COARSE-GRAINED SOILS >50% passes #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[3] gravels, gravel-sand mixtures, little or no fines	GW
			Poorly-graded[3] gravels, gravel-sand mixtures, little or no fines	GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[3] gravel-sand-silt mixtures	GM
			Clayey gravels, poorly-graded[3] gravel-sand-clay mixtures	GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[3] sands, gravelly sands, little or no fines	SW
			Poorly-graded[3] sands, gravelly sands, little or no fines	SP
		SANDS with >15% fines	Silty sands, poorly-graded[3] sand-gravel-silt mixtures	SM
			Clayey sands, poorly-graded[3] sand-gravel-clay mixtures	SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity	ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	CL
			Organic silts and clays of low plasticity	OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt	MH
			Inorganic clays of high plasticity, fat clays	CH
			Organic silts and clays of medium to high plasticity	OH
HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content	PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = *140 pound hammer dropped 30 inches*

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

[3]Note:
Well-graded = poorly sorted
Poorly-graded = well sorted

PLASTICITY

Nonplastic	
Low	
Medium	
High	

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

▽ Depth to first water (time and date)

▼ Depth to water after drilling (time and date)

MWH	Client: GE/UNC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B3 Sheet 2 of 6

Drilling Company: SEE INFO ON	Drilling Rig:	Bit Type:	Start Date:
Drillers (day / night): FIRST PAGE	Drilling Method:	Logged by:	Finish Date:
Field Representitive (day / night):	Core Diameter:		Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
10	MOD Cal 2" ID	8	6		SP	10.7'-11.0' moderately cemented, caliche			
		11	6						
11									
12									
13								13.5' - driller notes weathered bedrock or grave	
14									
	2"	50	2		SS	refusal at 14.65' sandstone, white (7.5YR 8/1), fine- to medium-grained, moderately weathered with iron oxidation, weak to very weak, soft to moderately soft,		finish - 1530	
15						14.65 - 15.9 ft bgs - NO RECOVERY			
16						COMPLETED HOLLOW STEM AUGER DRILLING at 14.65 feet bgs. SET HWT CASING TO CONTINUE DRILLING INTO BEDROCK LOG CONTINUED ON NEXT PAGE.			
17									
18									
19									
20									

COARSE-GRAINED SOILS >50% passes #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines — GW
		GRAVELS with >15% fines	Poorly-graded[1] gravels, gravel-sand mixtures, little or no fines — GP
			Silty gravels, poorly-graded[1] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[1] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[1] sands, gravelly sands, little or no fines — SW
			Poorly-graded[1] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[1] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[1] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
			Organic silts and clays of medium to high plasticity — OH
	HIGHLY ORGANIC SOILS		Peat, humus, swamp soils with high organic content — PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

[1]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY: Nonplastic, Low, Medium, High

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

▽ Depth to first water (time and date)

▼ Depth to water after drilling (time and date)

MWH	Project: GE/UNC NEAR JETTY GEOTECH INV.	ROCK CORE LOGGING FORM	BOREHOLE No.: B3
	Project Location:		Sheet 3 of 6
	Project Number:		

Drilling Company: National	Inclination: 90	Groundwater Level & Date Measured									Start Date: 11/9/16
Driller: M. Cain	Azimuth: –	Water Level:	NA								Finish Date: 11/10/2016
Drilling Method: Diamond Wireline	Northing: 125 0725606 UTM	Date:	–								Total Depth: 51.4 feet
Drilling Rig: CME-B5	Easting: 3947617B NAD 83	Time:	–								Logged By: J. VanPelt / S. Downey
Drill Bit Type/Size:	Elevation: Handheld GPS	Casing Depth	17.7'								Checked By:

Depth / Elevation	Drill Time, 24-hr (Rate, ft/hr)	Run No.	Box No.	Recovery (Driven / Recovered)	RQD (Total > 4-in. / Driven)	Fractures / foot	Weathering	Strength	Lithology / Symbol	Material Description	Fracture Drawing Number	Dip / Core Axis	Type of Disc.	Width	Type of Infilling	Amount of Infilling	Surface Shape	Roughness	Spacing	Permeability	Remarks	Well Details
15										CONTINUED FROM PREVIOUS PAGE											11/9/16 - drilled to 17.7' w/ HWT pipe (casing depth)	
16	11/10/16 0815					>10				SANDSTONE, very pale brown (10YR 8/2) with reddish brown (7.5YR 7/8) iron oxidation banding fine to coarse grained, with several coarsening downward sequences. slightly weathered locally moderately weathered weak to moderately strong moderately hard, very thin to thickly bedded, with local cross bedding. Bedding typically 65°-85° to core axis. sub-angular quartz grains												
17						>10						BZ	J/B		Fe	Sp-Pa		S-Sr				
18				(83%)	(42%)	7						80	MB J/B	Vn	Fe	Su	Pl	S				
												90	J/B	Vn	Fe	Su	Pl	S				
												80	J/B	Vn	Fe	Su	Pl	S				
												85	J/B	Vn	Fe	Sp	Pl	S				
												85	J/B	Vn	Fe	Sp	Pl	S				
19		1	1	4.5'/5.4'	2.25'/5.4'	2	W2	R1-R2					MB									
												80	J/B	Vn	Fe	Su	Pl	S				
												70	J/B	Vn	Fe	Sp	Pl	S				
20													MB									
						2						75	J/B	Vn	Fe	Su	Pl	S				
													MB									
21	0823											80	J/B	Vn	Fe	Pa/Sp	Pl	S				
	0836 0844					1						MB 65	J/B	Vn	Fe	Su	Pl	S				
22				(102%)	(98%)	2						90	J/B	Vn	Fe	Su	Pl	S				
												80	J/B	Vn	Fe	Sp	Pl	S				
23				10.2'/10.0'	9.75'/10.0'	0	W2	R1-R2														
		2	1																			
24						1															B3-24.2-24.9 Sampled	
												75	J/B	Vn	Fe	Su	Pl	S				
25																					Sampled →	

DISCONTINUITY TYPE	APERATURE	INFILLING TYPE	INFILLING AMOUNT	SHAPE	ROUGHNESS	DISCONTINUITY SPACING	WEATHERING	STRENGTH
F - Fault J - Joint (Discontinuity) Fz - Fractrue Zone S - Shear Sz - Shear Zone V - Vein Fo - Foliation B - Bedding Joint MB - Mechanical Break BZ - Broken Zone	Tight (T) 0 Very Narrow (Vn) <0.05" (<1.3 mm) Narrow (N) 0.05-0.1" (1.3 - 2.5 mm) Open (O) 0.1-0.5" (2.5 - 12.7 mm) Wide (W) >0.5" (>12.7 mm)	Bi - Biotite Cl - Clay Ca - Calcite Ch - Chlorite Ep - Epidote Fe - Iron Oxide Gy - Gypsum H - Healed Mn - Manganese My - Mylonite No - None Py - Pyrite Qz - Quartz Sd - Sand Si - Silt Un - Unknown	Clean (No) Stained (Su) Spotty (Sp) Partial Filled (Pa) Filled (Fi) Cemented (Cm)	Wa - Wavy Pl - Planer St - Stepped Ir - Irregular	Slickensided (Slk) Visual evidence of polishing, striations Smooth (S) Surface appears and feels smooth Slightly rough (Sr) Asperities are distinguishable and can be felt Rough (R) Asperities are clearly visible, some ridges evident, surface feels abrasive Very rough (Vr) Near-vertical ridges occur on surface	Extremely Wide (EW) >6 ft Wide (W) 2 ft - 6 ft Moderate (M) 8 in - 2 ft Close (C) 2.4 in - 8 in Very Close (VC) 0.75-in - 2.4 in Extremely Close (Ex) <0.75 in	Fresh (W1) Slightly (W2) Moderately (W3) Highly (W4) Decomposed or Completely (W5) Residual Soil (W6)	R0 Extremely weak R1 Very weak R2 Weak R3 Moderately strong R4 Strong R5 Very Strong R6 Extremely strong

MWH	Project: GE/UNC Project Location: Project Number:	ROCK CORE LOGGING FORM	BOREHOLE No.: B3 Sheet 4 of 6

Drilling Company: SEE INFO ON	Inclination:	Groundwater Level & Date Measured							Start Date:
Driller: FIRST PAGE	Azimuth:	Water Level:							Finish Date:
Drilling Method: OF LOG	Northing:	Date:							Total Depth:
Drilling Rig:	Easting:	Time:							Logged By:
Drill Bit Type/Size:	Elevation:	Casing Depth							Checked By:

Depth / Elevation	Drill Time, 24-hr (Rate, ft/hr)	Run No.	Box No.	Recovery Driven / Recovered	RQD Total > 4-in. / Driven	Fractures / foot	Weathering	Strength	Lithology / Symbol	Material Description	Remarks	Well Details
25			1			2				SANDSTONE CONTINUED	B3-24.9-25.6 Sampled	
26						0						
27		2		(102%)	(98%)	0						
28			2	10.20/10.00'	9.75'/10.00'	1	W2	R1-R2				
29						0					B3-28.8-29.5 Sampled	
30						1						
31	08:44 09:05 09:33					0						
32				(97%)	(79%)	1	W2	R1-R2		Bedding ~70-80°		
33		3	2	9.70/10.00'	7.90/10.00'	4						
34						1	W3	R1-R0		COAL, Black (N 2.5/0), Lignitic to bituminous. ORGANIC CLAY ← fine gravel sand coarse sand bedrock clasts, angular.	contact w/coal	
35												

DISCONTINUITY DATA

Depth	Fracture Drawing Number	Dip / Core Axis	Type of Disc.	Width	Type of Infilling	Amount of Infilling	Surface Shape	Roughness	Spacing	Permeability
25.5		80	J/B	VN	No	No	Pl	S		
25.7		75	J/B	VN	Fe	Pa	Pl	S		
26.2		MB								
28.9		85	J/B	VN	Carb, Clay	Pa	Pl	S		
30.0										
31.5		70	J/B	VN	No	No	Pl	S		
32.0		MB								
32.5		80	J/B	VN	No	No	Pl	S		
33.5		70	J/B	VN	Fe	Sp	Pl	S		
33.8		20-25	J	W	Cl, Fe Mn	F.	Pl	S		
34.5		85	C	N	Fe					

DISCONTINUITY TYPE	APERATURE	INFILLING TYPE	INFILLING AMOUNT	SHAPE
F - Fault J - Joint (Discontinuity) Fz - Fractrue Zone S - Shear Sz - Shear Zone V - Vein Fo - Foliation B - Bedding Joint MB - Mechanical Break BZ - Broken Zone	Tight (T) 0 Very Narrow (Vn) <0.05" (<1.3 mm) Narrow (N) 0.05-0.1" (1.3 - 2.5 mm) Open (O) 0.1-0.5" (2.5 - 12.7 mm) Wide (W) >0.5" (>12.7 mm)	Bi - Biotite Cl - Clay Ca - Calcite Ch - Chlorite Ep - Epidote Fe - Iron Oxide Gy - Gypsum H - Healed Mn - Manganese My - Mylonite No - None Py - Pyrite Qz - Quartz Sd - Sand Si - Silt Un - Unknown	Clean (No) Stained (Su) Spotty (Sp) Partial Filled (Pa) Filled (Fi) Cemented (Cm)	Wa - Wavy Pl - Planer St - Stepped Ir - Irregular

ROUGHNESS	
Slickensided (Slk)	Visual evidence of polishing, striations
Smooth (S)	Surface appears and feels smooth
Slightly rough (Sr)	Asperities are distinguishable and can be felt
Rough (R)	Asperities are clearly visible, some ridges evident, suface feels abrasive
Very rough (Vr)	Near-vertical ridges occur on surface

DISCONTINUITY SPACING	
Extremely Wide (EW)	>6 ft
Wide (W)	2 ft - 6 ft
Moderate (M)	8 in - 2 ft
Close (C)	2.4 in - 8 in
Very Close (VC)	0.75-in - 2.4 in
Extremely Close (Ex)	<0.75 in

WEATHERING	STRENGTH
Fresh (W1)	R0 Extremely weak
Slightly (W2)	R1 Very weak
Moderately (W3)	R2 Weak
Highly (W4)	R3 Moderately strong
Decomposed or Completely (W5)	R4 Strong
Residual Soil (W6)	R5 Very Strong
	R6 Extremely strong

27.1

MWH

Project: GE/UNC NECR JETTY
Project Location:
Project Number:

ROCK CORE LOGGING FORM

BOREHOLE No.: B3
Sheet 5 of 6

Drilling Company: SEE INFO ON	Inclination:	Groundwater Level & Date Measured						Start Date:
Driller: FIRST PAGE	Azimuth:	Water Level:						Finish Date:
Drilling Method: OF LOG	Northing:	Date:						Total Depth:
Drilling Rig:	Easting:	Time:						Logged By:
Drill Bit Type/Size:	Elevation:	Casing Depth						Checked By:

Depth / Elevation	Drill Time, 24-hr (Rate, ft/hr)	Run No.	Box No.	Recovery Driven / Recovered	RQD Total > 4-in. / Driven	Fractures / foot	Weathering	Strength	Lithology / Symbol	Material Description	Fracture Drawing	Number	Dip / Core Axis	Type of Disc.	Width	Type of Infilling	Amount of Infilling	Surface Shape	Roughness	Spacing	Permeability	Remarks	Well Details
35			2							ORGANIC CLAY, cont. greenish black (10Y 2.5-1) to dark greenish gray (10Y 4/1) very soft to soft, weathered			90	J/B	Vn	Cl, Fe	Pa	Pl	Vr				
						1				← fine gravel													
36										grades to CLAYSTONE/SILTSTONE very dark gray (10Y 3/1), to light brownish gray (10Y 6/2) very fine grained, slightly to moderately weathered with iron oxidation along bedding and fractures.													
						1							80	J/B	Vn	Fe	Fi	Pl	R				
37				(97%)	(79%)																		
						0																	
38		3	3	9.70/10.00	7.90/10.00		W2-W3	R1					85	J/B	Vn	Cl	Pa	Pl	Sr				
						1																	
39						0																	
40											40												
						3							90	J		Fe	Pa	Pl	Sr				
													5	J		Fe	Fi	Na	S				
													80	J		Fe	Sp	Pl	Sr				
41	0933												50	J		Gy, Fe	Sp	Cu	S				
	0948 1019					4							MB										
													85	J/B	Vn	Fe	Sp	Pl	S				
													45	J	N	Gy	Sp	Pl	S				
													85	J/B	Vn	Fe	Su	Pl	S				
42						10				← fine gravels of siltstone bedrock													
								R0-R1						BZ									
			3	10.20/10.00'	8.45/10.00'					← fine gravels of siltstone bedrock.													
43				(102%)	(85%)	4	W2-W3	R1					55	J	Vn	Fe	Pa	Pl	S				
													90	J	Vn	Fe	Sp	Pl	S				
		4											85	J/B	Vn	Fe	Pa	Pl	Sr				
													85	J/B	Vn	Fe	Pa	Pl	Sr				
44													80	J/B	Vn	Fe	Su	Pl	S				
						3																	
			4										80	J/B	Vn	Fe	Sp	Pl	R				
45													75	J	Vn	Fe	Fi	Pl	S				

DISCONTINUITY TYPE	APERATURE	INFILLING TYPE	INFILLING AMOUNT	SHAPE	ROUGHNESS
F - Fault	Tight (T) 0	Bi - Biotite, Mn - Manganese	Clean (No)	Wa - Wavy	Slickensided (Slk) Visual evidence of polishing, striations
J - Joint (Discontinuity)	Very Narrow (Vn) <0.05" (<1.3 mm)	Cl - Clay, My - Mylonite	Stained (Su)	Pl - Planer	Smooth (S) Surface appears and feels smooth
Fz - Fractrue Zone	Narrow (N) 0.05-0.1" (1.3 - 2.5 mm)	Ca - Calcite, No - None	Spotty (Sp)	St - Stepped	Slightly rough (Sr) Asperities are distinguishable and can be felt
S - Shear	Open (O) 0.1-0.5" (2.5 - 12.7 mm)	Ch - Chlorite, Py - Pyrite	Partial Filled (Pa)	Ir - Irregular	Rough (R) Asperities are clearly visible, some ridges evident, suface feels abrasive
Sz - Shear Zone	Wide (W) >0.5" (>12.7 mm)	Ep - Epidote, Qz - Quartz	Filled (Fi)		Very rough (Vr) Near-vertical ridges occur on surface
V - Vein		Fe - Iron Oxide, Sd - Sand	Cemented (Cm)		
Fo - Foliation		Gy - Gypsum, Si - Silt			
B - Bedding Joint		H - Healed, Un - Unknown			
MB - Mechanical Break					
BZ - Broken Zone					

DISCONTINUITY SPACING	WEATHERING	STRENGTH
Extremely Wide (EW) >6 ft	Fresh (W1)	R0 Extremely weak
Wide (W) 2 ft - 6 ft	Slightly (W2)	R1 Very weak
Moderate (M) 8 in - 2 ft	Moderately (W3)	R2 Weak
Close (C) 2.4 in - 8 in	Highly (W4)	R3 Moderately strong
Very Close (VC) 0.75 in - 2.4 in	Decomposed or Completely (W5)	R4 Strong
Extremely Close (Ex) <0.75 in	Residual Soil (W6)	R5 Very Strong
		R6 Extremely strong

MWH	Project: GE/UNC Project Location: Project Number:	ROCK CORE LOGGING FORM	BOREHOLE No.: B3 Sheet 6 of 6

Drilling Company: SEE INFO	Inclination:	Groundwater Level & Date Measured									Start Date:
Driller: ON FIRST PAGE	Azimuth:	Water Level:									Finish Date:
Drilling Method: OF LOG	Northing:	Date:									Total Depth:
Drilling Rig:	Easting:	Time:									Logged By:
Drill Bit Type/Size:	Elevation:	Casing Depth									Checked By:

Depth / Elevation	Drill Time, 24-hr (Rate, ft/hr)	Run No.	Box No.	Recovery (Driven / Recovered)	RQD (Total > 4-in. / Driven)	Fractures / foot	Weathering	Strength	Lithology / Symbol	Material Description	Remarks	Well Details
45										CLAYSTONE CONTINUED		
46						1						
						6	W2-W3			grades to black coal @ 46.1'		
47				(102%)	(85%)	6		R1-R2				
48		4	4	10.20/10.00 8.45/10.00		1						
49						1	W2-W3	R1-R2		SILTSTONE to SANDSTONE, very dark gray (10YR 3/1) with abundant black (N 2.5/0) coal stringers. Very fine to fine-grained, slightly to moderately weathered, moderately strong to weak.		
50						1					B3-49.9-50.6 Sampled	
51	10:19									51.4'		
52										TOTAL DEPTH 51.4 feet below ground surface.		
53												
54												
55												

DISCONTINUITY DATA

Fracture Drawing Number	Dip / Core Axis	Type of Disc.	Width	Type of Infilling	Amount of Infilling	Surface Shape	Roughness	Spacing	Permeability
	90	J/B	Vn	Fe	Pa	Pl	S		
	75	J/B	Vn	Fe	Sp	Pl	Sr		
	15	J	Vn	Fe, An	Sp	Pl	S		
	80	J/B	Vn	Fe, Gy	Su	Pl	S		
	80	J/B	Vn	Fe, Gy	Su	Pl	S		
	85	J	Vn	Fe, Gy	Sp	St	S		
	85	J	Vn	Fe	Su	St	S		
	85	J	Vn	Fe	Sp	Pl	S		
	90	J	Vn	Fe	Fi	Pl	S		
	75	J	Vn	No	No	Pl	Sr		
	80	J	Vn	No	No	Pl	Sr		

DISCONTINUITY TYPE	APERATURE	INFILLING TYPE	INFILLING AMOUNT	SHAPE	ROUGHNESS
F - Fault J - Joint (Discontinuity) Fz - Fractrue Zone S - Shear Sz - Shear Zone V - Vein Fo - Foliation B - Bedding Joint MB - Mechanical Break BZ - Broken Zone	Tight (T) 0 Very Narrow (Vn) <0.05" (<1.3 mm) Narrow (N) 0.05-0.1" (1.3 - 2.5 mm) Open (O) 0.1-0.5" (2.5 - 12.7 mm) Wide (W) >0.5" (>12.7 mm)	Bi - Biotite Cl - Clay Ca - Calcite Ch - Chlorite Ep - Epidote Fe - Iron Oxide Gy - Gypsum H - Healed Mn - Manganese My - Mylonite No - None Py - Pyrite Qz - Quartz Sd - Sand Si - Silt Un - Unknown	Clean (No) Stained (Su) Spotty (Sp) Partial Filled (Pa) Filled (Fi) Cemented (Cm)	Wa - Wavy Pl - Planer St - Stepped Ir - Irregular	Slickensided (Slk) Visual evidence of polishing, striations Smooth (S) Surface appears and feels smooth Slightly rough (Sr) Asperities are distinguishable and can be felt Rough (R) Asperities are clearly visible, some ridges evident, suface feels abrasive Very rough (Vr) Near-vertical ridges occur on surface

DISCONTINUITY SPACING		WEATHERING	STRENGTH
Extremely Wide (EW)	> 6 ft	Fresh (W1)	R0 Extremely weak
Wide (W)	2 ft - 6 ft	Slightly (W2)	R1 Very weak
Moderate (M)	8 in - 2 ft	Moderately (W3)	R2 Weak
Close (C)	2.4 in - 8 in	Highly (W4)	R3 Moderately strong
Very Close (VC)	0.75-in - 2.4 in	Decomposed or Completely (W5)	R4 Strong
Extremely Close (Ex)	< 0.75 in	Residual Soil (W6)	R5 Very Strong
			R6 Extremely strong

An - Anhydrite

MWH	Client: GE/UNC Project Number: NECR Jetty Hollowstem	SOIL BORING LOG FORM	BOREHOLE No.: B4 Sheet 1 of 7

Drilling Company: National	Drilling Rig: CME-85	Bit Type: Auger 6 in ID HSA	Start Date: Nov 10 2016
Drillers (day / night): M. Cain	Drilling Method: Continuous Core	Logged by: S. Downey / J. VanPelt	Finish Date: Nov 11 2016
Field Representitive (day / night): S. Downey / J. VanPelt	Core Diameter:		Total Depth: 65 ft

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
0					SP	Poorly graded sand with gravel (SP) brown (7.5YR 5/3), medium dense, dry, coarse gravel (50%), fine gravel (20%), predominantly fine sand (60%) trace medium sand (10%), trace silt (5%)		Start @ 1429 hand auger to 2 ft bgs	
1								12S 0728763, 3947644	
								Location surveyed using handheld GPS (UTM NAD83)	
2									
3									
4									
5	2" ID MOD CAL	10	6			cobble - - - - grades to poorly graded sand (SP),			
	B4-5.5-6.0 10-NOV-2016 (SSO)	24	6		SP	reddish yellow (7.5YR 7/6), very stiff, dry, predominantly fine sand, trace silt and clay, weakly to moderately cemented			
6		21	6			at 6' moderately cemented at 6.5' increasing fine gravel, weakly cemented			
7									
8						cobble 8-8.5' decreasing fine gravel			
					SP-SC	fine sand with clay and silt (SP-SC) very pale brown (10YR 7/4), med. dense			
9									
10									

COARSE-GRAINED SOILS <50% passes #200 sieve			
GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines	GW
		Poorly-graded[1] gravels, gravel-sand mixtures, little or no fines	GP
	GRAVELS with >15% fines	Silty gravels, poorly-graded[1] gravel-sand-silt mixtures	GM
		Clayey gravels, poorly-graded[1] gravel-sand-clay mixtures	GC
SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[1] sands, gravelly sands, little or no fines	SW
		Poorly-graded[1] sands, gravelly sands, little or no fines	SP
	SANDS with >15% fines	Silty sands, poorly-graded[1] sand-gravel-silt mixtures	SM
		Clayey sands, poorly-graded[1] sand-gravel-clay mixtures	SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50	Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity	ML
		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	CL
		Organic silts and clays of low plasticity	OL
	SILTS AND CLAYS liquid limit >50	Inorganic silts, micaceous or diatomaceous fine sand or silt	MH
		Inorganic clays of high plasticity, fat clays	CH
		Organic silts and clays of medium to high plasticity	OH
HIGHLY ORGANIC SOILS		Peat, humus, swamp soils with high organic content	PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

[1]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY: Nonplastic, Low, Medium, High

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

Depth to first water (time and date)

Depth to water after drilling (time and date)

MWH	Client: GE/UNC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B4 Sheet 2 of 7

Drilling Company:	SEE INFO ON	Drilling Rig:	Bit Type:	Start Date:	
Drillers (day / night):	PAGE 1	Drilling Method:	Logged by:	Finish Date:	
Field Representitive (day / night):		Core Diameter:		Total Depth:	

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
10		4	6		SP-SC	trace caliche fine gravels			
		5	6						
11		5	6			increase in cementation to weakly to moderately cemented			
12									
13									
14						increase in cementation to moderately cemented			
15	MOD-CAL 2" ID	4	6		SP-SM	increase in fine sands, very fine grained poorly graded sand with silt, trace clay (SP-SM)			
		5	6						
16	B6 16.0-16.5 10-NOV-2016 (SSO)	6	6						
					SP-SC	@16.5 increase in clay, very fine SAND with clay and silt (SP-SC), non cemented, weakly indurated			
17									
18						18.3 - 19.4 weakly cemented			
19						19.4 dark yellowish brown (10YR 4/4), weakly to moderately cemented increase in very fine sands, still significant clay			
20									

COARSE-GRAINED SOILS >50% passes #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines	GW
			Poorly-graded[1] gravels, gravel-sand mixtures, little or no fines	GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[2] gravel-sand-silt mixtures	GM
			Clayey gravels, poorly-graded[2] gravel-sand-clay mixtures	GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[1] sands, gravelly sands, little or no fines	SW
			Poorly-graded[1] sands, gravelly sands, little or no fines	SP
		SANDS with >15% fines	Silty sands, poorly-graded[2] sand-gravel-silt mixtures	SM
			Clayey sands, poorly-graded[2] sand-gravel-clay mixtures	SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity	ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	CL
			Organic silts and clays of low plasticity	OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt	MH
			Inorganic clays of high plasticity, fat clays	CH
			Organic silts and clays of medium to high plasticity	OH
HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content	PT

CONSISTENCY (Silts and Clays)

Term	(SPT) 1.4"ID	Blows/ft* 2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	(SPT) 1.4"ID	Blows/ft* 2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

[1]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY: Nonplastic, Low, Medium, High

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
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GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS: Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

▽ Depth to first water (time and date)

▼ Depth to water after drilling (time and date)

MWH	Client: GE / UNC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B4 Sheet 3 of 7

Drilling Company:	SEE INFO ON	Drilling Rig:	Bit Type:		Start Date:
Drillers (day / night):	PAGE 1	Drilling Method:	Logged by:		Finish Date:
Field Representitive (day / night):		Core Diameter:			Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
20	2" ID MODCAL	5	6		SP	poorly graded very fine sand (SP)			
	B4 20.5-21.0 10-Nov-2016 (SSD)	4	6						
21		6	6		ML	grades to clayey SILT with sand (ML) very fine sand very thinly bedded, breaks along thin bedding planes, weak to moderately cemented			
22									
23						moderately indurated, trace caliche ↓			
24									
25						increase in caliche throughout ↓			
26					SM	26.2-26.8 silty sand (SM) yellowish brown (10YR 5/6)			
27					SM	dark yellowish brown (10YR 4/4) clayey silt with sand (SM), traces of caliche, breaks along thin bedding planes, dry to moist			
28									
29									
30									

COARSE-GRAINED SOILS >50% passes #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines — GW
			Poorly-graded[1] gravels, gravel-sand mixtures, little or no fines — GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[1] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[1] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[1] sands, gravelly sands, little or no fines — SW
			Poorly-graded[1] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[1] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[1] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
			Organic silts and clays of medium to high plasticity — OH
HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content — PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

[1]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY: Nonplastic, Low, Medium, High

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
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GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

▽ Depth to first water (time and date)

▼ Depth to water after drilling (time and date)

MWH	Client: GE/UNC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B4 Sheet 4 of 7

Drilling Company:	SEE INFO ON	Drilling Rig:	Bit Type:		Start Date:
Drillers (day / night):	PAGE 1	Drilling Method:	Logged by:		Finish Date:
Field Representitive (day / night):		Core Diameter:			Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
30	2" ID Mud Cac	5	6		SM	slight increase in caliche (~5%)			
	B4 30.5-31.0 10-NOV-2016 (SSO)	8	6						
31		7	6			decrease in caliche, trace amounts			
						trace amounts of coal/organic material present, dry to moist			
32									
33									
34									
35					ML	silt with sand (ML), very fine sands, weakly cemented, dry to moist, yellowish brown (10YR 5/4),			
36									
37									
38									
39					SP-SM	increase in sand content Poorly graded sand with silt (SP-SM), yellowish brown (10YR 5/6)			
40									

COARSE-GRAINED SOILS >50% passes #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines — GW
			Poorly-graded[1] gravels, gravel-sand mixtures, little or no fines — GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[1] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[1] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[1] sands, gravelly sands, little or no fines — SW
			Poorly-graded[1] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[1] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[1] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
			Organic silts and clays of medium to high plasticity — OH
HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content — PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
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dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

[1]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY: Nonplastic, Low, Medium, High

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
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CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
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GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

Depth to first water (time and date)

Depth to water after drilling (time and date)

MWH	Client: GE / UNC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B4 Sheet 5 of 7

Drilling Company: SEE INFORMATION ON	Drilling Rig:	Bit Type:	Start Date:
Drillers (day / night): PAGE ONE OF LOG	Drilling Method:	Logged by:	Finish Date:
Field Representitive (day / night):	Core Diameter:		Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
40	= ID MODCAL	4	6		CL	increasing clay content 40-40.5' Silty CLAY (CL), dark grayish brown (10YR 4/2) dry to moist, slightly indurated.			
	B4 40.5 - 41.5 10-Nov-2016 (SSO)	5	6						
41		6	6		SP-SM	Poorly-graded SAND with silt (SP-SM), yellowish brown (10YR 5/4), dry to moist, some clay			
42						grades to weakly to moderately cemented			
43									
						coarse gravel			
44									
45					CL	Lean CLAY (CL), brown (10YR 4/3), dry to moist, sand (5-10%), silt (15%), medium plasticity			
46									
47	B4 - 45.0 - 49.0 (GS) 10-Nov-2016								
48									
49					SP-SM	Poorly-graded SAND with silt (SP-SM), brown (10YR 4/3), dry to moist, trace fine gravel, clay (5-10%) weakly to moderately cemented, trace caliche.			
50									

COARSE-GRAINED SOILS <50% passes #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[0] gravels, gravel-sand mixtures, little or no fines — GW
			Poorly-graded[0] gravels, gravel-sand mixtures, little or no fines — GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[0] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[0] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[0] sands, gravelly sands, little or no fines — SW
			Poorly-graded[0] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[0] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[0] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
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HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content — PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
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soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
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* = 140 pound hammer dropped 30 inches

GRAIN SIZE

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Boulders	>300	>12
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Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below:

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

[0] Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY: Nonplastic, Low, Medium, High

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

▽ Depth to first water (time and date)

▼ Depth to water after drilling (time and date)

MWH	Client: GE/UMC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B4 Sheet 6 of 7

Drilling Company:	SEE INFO ON	Drilling Rig:	Bit Type:	Start Date:	
Drillers (day / night):	PAGE 1	Drilling Method:	Logged by:	Finish Date:	
Field Representitive (day / night):		Core Diameter:		Total Depth:	

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
50	2" ID MOD CAL	3	6		SP-SM	increase in caliche, slight iron oxide staining, slight increase in clay content (10-15%), predominantly fine-grained sand w/ silt, brown (10YR 5/3), dry to moist, very loose		end of clay 11/10/16 @ 1630, end at 51.5' 11/11/16 - begin drilling at 51.5 feet @ 08:05	
	B4 50.5-51.0 10-Nov-2016 (SSO)	6	6						
51		7	6						
52	B4-51.5-52.5 11-Nov-2016 (GS)				CL	grades to lean clay with sand (CL), predominantly very fine sand (15%), trace medium sand (<5%), silt (20%), low plasticity, weakly cemented, brown (10YR 4/3)			
53						lean clay with sand (CL) yellowish brown (10YR 5/4), very fine sand (10%), silt (20%), low to medium plasticity, medium stiff			
54						coarse gravel As Above, brown (10YR 4/3), trace organic content, trace coarse sand			
55				0.75					
56	B4-TW-55.0-57.2 11-Nov-2016								
57				3.0		57-58' increase in sand content			
					SC	clayey sand (SC), brown (10YR 4/3), trace fine gravel / coarse sand, fine-grained sand (60%), silt (20%), clay (15%), no to low plasticity			
58						58.0-58.8 CL lean clay with sand (CL) yellowish brown (10YR 5/4) very fine-grained sand, low to medium plasticity, trace fine gravel			
59					CL	58.8' grades to sandy lean clay (CL), increase in sand content, trace fine to coarse gravel			
					SC	59.2 grades to clayey sand (SC), brown (10YR 4/3) iron oxidation grades to very pale brown (10YR 8/2), weathered bedrock			
60									

COARSE-GRAINED SOILS >50% passes #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines — GW
			Poorly-graded[2] gravels, gravel-sand mixtures, little or no fines — GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[2] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[2] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[1] sands, gravelly sands, little or no fines — SW
			Poorly-graded[2] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[2] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[2] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
			Organic silts and clays of medium to high plasticity — OH
HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content — PT

[1]Note: Well-graded = poorly sorted; [2]Poorly-graded = well sorted

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

PLASTICITY

Nonplastic	
Low	
Medium	
High	

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

▽ Depth to first water (time and date)

▼ Depth to water after drilling (time and date)

MWH	Client: GE / LINC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B4 Sheet 7 of 7

Drilling Company:	SEE INFO ON	Drilling Rig:	Bit Type:		Start Date:
Drillers (day / night):	PAGE 1	Drilling Method:	Logged by:		Finish Date:
Field Representitive (day / night):		Core Diameter:			Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
60	11/9 2 M.C.	50	3		SS	sandstone, pale yellow (2.5Y 8/4), poorly graded silty sand (SM), predominantly fine-grained sand, >15% fines, highly weathered (W4) to moderately weathered (W3), very weak (R1) to weak (R2), soft to moderately soft (H6-H5), laminated to very thinly bedded with iron oxidation, weakly cemented			
61									
62									
63									
64					SS	63.7 grades to slightly to moderately weathered (W2-W3), weak to moderately strong (R2-R3), moderately soft to moderately hard (H5-H4), moderately to strongly cemented, spotty iron oxidation (~10%)		complete borehole @ 0900 11/11/16	
65						TOTAL DEPTH = 65.0 feet below ground surface 11-NOV-2016 Boring backfilled with cuttings to surface 11-NOV-2016			

COARSE-GRAINED SOILS >50% passes #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines — GW
			Poorly-graded[1] gravels, gravel-sand mixtures, little or no fines — GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[1] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[1] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[1] sands, gravelly sands, little or no fines — SW
			Poorly-graded[1] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[1] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[1] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
			Organic silts and clays of medium to high plasticity — OH
HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content — PT

CONSISTENCY (Silts and Clays)

Term	(SPT) 1.4"ID	Blows/ft* 2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	(SPT) 1.4"ID	Blows/ft* 2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

*= *140 pound hammer dropped 30 inches*

[1]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY: Nonplastic, Low, Medium, High

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

Depth to first water (time and date)

Depth to water after drilling (time and date)

MWH	Client: GE/UNC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B5 Sheet 1 of 13

Drilling Company: National	Drilling Rig: CME-85	Bit Type:	Start Date: 11/13/16
Drillers (day / night): M. Cain	Drilling Method: CC	Logged by: S. Downey / J. Van Pelt	Finish Date:
Field Representitive (day / night): S. Downey / J. VanPelt	Core Diameter:		Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
0					SM	Silty SAND (SM), yellowish brown (10YR 5/4), loose, dry, coarse sand to fine gravel (10%), predominantly fine-grained sand		Hand auger to 3 ft Start at 0820 Start drilling at 0840	
1								12S 0725797, 3947622 Location surveyed w/ hand held GPS (UTM NAD 83)	
2									
3					SM	grades to dark yellowish brown (10YR 4/4), clay (20%), low to moderate plasticity			
4									
5	2" ID Mod Cal	18	6			grades to yellowish brown (10YR 5/4), very stiff to hard, trace sandstone lenses and Fe oxide staining, trace organics			
	B5-5.5-6.0 (SSO) 13-Nov-2016	34	6						
6		50/5"	6		SP	Poorly graded SAND (SP), very pale brown (10YR 8/3), loose, dry, predominantly fine sand, trace fine gravel, trace organics			
7									
8					SM	same as 3.5-5', slightly indurated, dry to moist			
9						grades to yellowish brown (10YR 5/4), slightly to moderately indurated very thinly bedded with caliche and iron staining, moderately cemented, hard, dry,			
	B5-9.2-10.0 (GS) 13-Nov-2016								
10									

COARSE-GRAINED SOILS More than 50% retained on #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[2] gravels, gravel-sand mixtures, little or no fines — GW
			Poorly-graded[2] gravels, gravel-sand mixtures, little or no fines — GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[2] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[2] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[2] sands, gravelly sands, little or no fines — SW
			Poorly-graded[2] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[2] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[2] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS More than 50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
			Organic silts and clays of medium to high plasticity — OH
HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content — PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

[2]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY	MOISTURE	CEMENTATION
Nonplastic	Term — Field Test	Term — Field Test
Low	Dry — Absence of moisture, dry to touch	Weak — Crumbles or breaks with handling or slight finger pressure.
Medium	Moist — Damp, does not wet palm	Moderate — Crumbles or breaks with considerable finger pressure.
High	Wet — Visible Free Water	Strong — Will not crumble or break with finger pressure.

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

Depth to first water (time and date)

Depth to water after drilling (time and date)

MWH	Client: GE/UNC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B5 Sheet 2 of 13

Drilling Company: See info on first	Drilling Rig:	Bit Type:	Start Date:
Drillers (day / night): Page of Log	Drilling Method:	Logged by:	Finish Date:
Field Representitive (day / night):	Core Diameter:		Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
10	2" ID MOD CAL	10	6		SM	same as above, very pale brown (10YR 7/4)			
	B5-10.5-11.0 (SSO) 13-Nov-2016	9	6						
11		8	6			grades to yellowish brown (10YR 5/4), low plasticity, clay (5-10%)			
					ML	SILT (ML), light yellowish brown (10YR 6/4), soft, dry, trace sand (5%), clay (20-30%), low to moderate plasticity			
12									
						NR			
13						trace clay, weakly cemented			
	B5-13.7-15.0 (GS) 13-Nov-2016				SM	sandy SILT (SM), brown (10YR 5/3), medium stiff, very dry, predominantly fine sand, trace clay, non plastic			
14									
15	2" ID MOD CAL	5	6		ML	SILT (ML), same as 11.5' trace caliche (5%), clay lense (10-5%) 1-1.5 cm thick, moderate cementation			
	B5-15.5-16.0 (SSO) 13-Nov-2016	7	6						
16		10	6			grades to weakly cemented			
						No Recovery			
17					ML	same as above 11.5', brownish yellow (10YR 6/6)			
18	B5-18.2-20.0 (GS) 13-Nov-2016				CL	CLAY (CL), yellowish brown (10YR 5/4), hard, very dry, medium plasticity, trace white material (caliche?), very thinly bedded, moderately indurated			
19									
20									

COARSE-GRAINED SOILS >50% coarse grained	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[2] gravels, gravel-sand mixtures, little or no fines — GW
			Poorly-graded[2] gravels, gravel-sand mixtures, little or no fines — GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[2] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[2] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[2] sands, gravelly sands, little or no fines — SW
			Poorly-graded[2] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[2] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[2] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
			Organic silts and clays of medium to high plasticity — OH
HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content — PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

[2]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY: Nonplastic, Low, Medium, High

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

Depth to first water (time and date)

Depth to water after drilling (time and date)

MWH	Client: GEIUNC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B5 Sheet 3 of 13

Drilling Company: See info on first	Drilling Rig:	Bit Type:	Start Date:
Drillers (day / night): Page of 109	Drilling Method:	Logged by:	Finish Date:
Field Representitive (day / night):	Core Diameter:		Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
20	Mod-cal 2" ID	8	6	>4.5	CL	same as above			
		12	6						
21	B5-21.0-21.5 (GS) 13-Nov-2016	17	6						
						grades to brownish yellow (10YR 6/8), laminated, caliche stringers (<3mm)			
22									
23	B5-21.5-25.0 (GS) 13-Nov-2016								
24									
25									
26	B5-TW-25.0-27.0 (TW) 13-Nov-2016					grades to yellowish brown (10YR 5/4), dry to moist			
27					CL	same as above, dry to moist, no caliche stringers			
28	B5-27.0-30.0 (GS) 13-Nov-2016								
29									
30									

COARSE-GRAINED SOILS >50% retained #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines — GW
			Poorly-graded[1] gravels, gravel-sand mixtures, little or no fines — GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[1] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[1] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[1] sands, gravelly sands, little or no fines — SW
			Poorly-graded[1] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[1] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[1] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
			Organic silts and clays of medium to high plasticity — OH
HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content — PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

[1]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY: Nonplastic, Low, Medium, High

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

Depth to first water (time and date)

Depth to water after drilling (time and date)

MWH	Client: GE / ONC	SOIL BORING LOG FORM	BOREHOLE No.: B5
	Project Number:		Sheet 4 of 13

Drilling Company: See intro on	Drilling Rig:	Bit Type:	Start Date:
Drillers (day / night): first page of log	Drilling Method:	Logged by:	Finish Date:
Field Representitive (day / night):	Core Diameter:		Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
30	MOD-CAL 2" ID	6	6	4.0/3.75	CL	same as above			
		11	6						
31		14	6			grades to trace caliche (<5%), black organic matter (5-10%)			
32	B5-31.5-35.0 (GS) 13-Nov-2014								
33									
34									
35						same as above			
36									
37					ML	clayey SILT (ML), yellowish brown (10YR 5/6) soft, dry to moist, trace fine-grained sand (10%), medium plasticity, noncemented			
					SM	Silty SAND (SM), light yellowish brown (10YR 6/4) to yellowish brown (10YR 5/4), loose, dry to moist, fine-grained sand			
38					ML	Clayey SILT (ML), same as above (38.8')			
39	B5-38.7-40.0 (GS) 13-Nov-2014				SM	Silty SAND (SM), same as above (37.6'-38')			
40									

COARSE-GRAINED SOILS >50% passes #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines — GW
			Poorly-graded[1] gravels, gravel-sand mixtures, little or no fines — GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[1] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[1] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[1] sands, gravelly sands, little or no fines — SW
			Poorly-graded[1] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[1] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[1] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
			Organic silts and clays of medium to high plasticity — OH
HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content — PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below:

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

[1]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY: Nonplastic, Low, Medium, High

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

Depth to first water (time and date)

Depth to water after drilling (time and date)

MWH	Client: GE/UNC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B5 Sheet 5 of 13

Drilling Company: See info on	Drilling Rig:	Bit Type:	Start Date:
Drillers (day / night): first page of log.	Drilling Method:	Logged by:	Finish Date:
Field Representitive (day / night):	Core Diameter:		Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
40	"2" D MODCAL	5	6		CL	Silty CLAY (CL) light yellowish brown (10YR 6/4), soft to medium stiff, dry to moist, some fine-grained sand (10-15%), moderate plasticity			
	B5-40.5-41.0 (SS0) 13-Nov-2016	6	6						
41		10	6			same as above, grades to stiff, drier			
42						No Recovery			
43					CL	grades to yellowish brown (10YR 5/4), fine-grained sand (5%-10%)			
44					ML	Sandy SILT (ML), yellow (10YR 8/4), loose, dry to moist, fine-grained sand			
					CL	Silty CLAY (CL), same as above @ 40'			
45						small sandy silt lense at 45'			
					SM	Sandy SILT (SM), light yellowish brown (10YR 6/4), loose, dry to moist, clay (20%-30%), moderate plasticity			
46									
47					CL	Silty CLAY (CL), same as above @ 40'			
48					ML	Clayey SILT (ML) with sand, brownish yellow (10YR 6/6), soft, dry to moist, fine-grained sand, lenses of black organic matter			
49	B5-49.0-50.0 (SS) 13-Nov-2016				SM	Sandy SILT (SM), yellowish brown (10YR 5/6), same as above (45-47')			
50									

COARSE-GRAINED SOILS >50% passes #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines — GW
		GRAVELS with >15% fines	Poorly-graded[1] gravels, gravel-sand mixtures, little or no fines — GP
			Silty gravels, poorly-graded[1] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[1] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[1] sands, gravelly sands, little or no fines — SW
			Poorly-graded[1] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[1] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[1] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
			Organic silts and clays of medium to high plasticity — OH
HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content — PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

[1]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY: Nonplastic, Low, Medium, High

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

Depth to first water (time and date)

Depth to water after drilling (time and date)

MWH	Client: GE/WDC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B5 Sheet 6 of 13

Drilling Company: See info on	Drilling Rig:	Bit Type:	Start Date:
Drillers (day / night): first Page of Log	Drilling Method:	Logged by:	Finish Date:
Field Representitive (day / night):	Core Diameter:		Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
50						No Recovery			
51									
52					CL	Silty CLAY (CL), same as 40', small lenses of black organic matter			
					SM	SILTY SAND (SM) lense with clay (20-30%)			
	B5-52.6-53.9 (GS) 13-Nov-2016				ML	Clayey SILT (ML) with sand, yellowish brown (10YR 5/4), same as 48.8', low to moderate plasticity			
53									
54					SM	Silty SAND (SM), yellowish brown (10YR 5/6), loose, dry to moist, predominantly fine-grained sand, clay (5-10%), non plastic			
55						No Recovery			
56									
57					SM	Silty SAND (SM), light yellowish brown (10YR 6/4), loose, dry to moist, fine-grained sand, little to no clay			
58					ML	Clayey SILT (ML) w/ sand, same as 52.6'			
59					ML	Sandy SILT (ML), yellowish brown (10YR 5/4), same as 57.1'			
60					SP	Poorly-graded SAND (SP), yellowish brown (10YR 5/6), loose, dry to moist, fine gravel to coarse sand (10%)			

COARSE-GRAINED SOILS >50% passes #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines — GW
			Poorly-graded[1] gravels, gravel-sand mixtures, little or no fines — GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[1] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[1] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[1] sands, gravelly sands, little or no fines — SW
			Poorly-graded[1] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[1] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[1] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
			Organic silts and clays of medium to high plasticity — OH
HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content — PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

[1]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY: Nonplastic, Low, Medium, High

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

Depth to first water (time and date)

Depth to water after drilling (time and date)

MWH	Client: GE/DNC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B5 Sheet 7 of 13

Drilling Company: See info on first	Drilling Rig:	Bit Type:	Start Date:
Drillers (day / night): Page of Log	Drilling Method:	Logged by:	Finish Date:
Field Representitive (day / night):	Core Diameter:		Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
60	2.0 ID MODCAL	4	6		CL	CLAY(CL), brown (10YR 4/3), soft, moist, black organic matter (10-15%) grades to poorly graded SAND (SP), same as 59.9', no coarse sand or gravel			
	B5-60.5-61.0 (SS0) 13-Nov-2016	4	6						
61		12	6		ML SP	Clayey SILT(ML), same as 52.1' poorly-graded SAND (SP), as above, with some coarse sand and fine gravel (5-10%)			
						No recovery			
62					SP	Poorly graded SAND (SP), same as 59.9', no coarse sand or gravel			
					SM	Silty SAND (SM), same as 57.1		Interbedded silty sand and poorly graded sand lenses	
63	B5-63.0-63.6 (GS) 13-Nov-2016				SP	Poorly graded SAND (SP), same as above 62.2'			
64					SM	Silty SAND, see above			
					SP	Poorly graded SAND, see above			
65						No recovery			
66									
67					SP	Poorly graded SAND (SP), yellowish brown (10YR 5/6), loose, dry to moist, coarse and fine gravel (15%-20%) angular FE staining			
					SM	Silty SAND (SM), see above			
68					SM	yellowish brown (10YR 5/6), coarse sand and fine gravel (5-10%)			
69	B5-68.9-69.5 (GS) 13-Nov-2016				CL	Silty CLAY (CL) with sand, yellowish brown (10YR 5/4), soft, moist, fine-grained sand (10-20%) medium plasticity			
					ML	Clayey SILT (ML) with sand, dark yellowish brown (10YR 4/4), very stiff, dry to moist, fine-grained sand (10-20%)			
70									

COARSE-GRAINED SOILS 50% passes #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines — GW
			Poorly-graded[1] gravels, gravel-sand mixtures, little or no fines — GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[1] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[1] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[2] sands, gravelly sands, little or no fines — SW
			Poorly-graded[2] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[2] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[2] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS 50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
			Organic silts and clays of medium to high plasticity — OH
HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content — PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

PLASTICITY

Nonplastic	
Low	
Medium	
High	

[1]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

Depth to first water (time and date)

Depth to water after drilling (time and date)

MWH	Client: GE/UNC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B5 Sheet 8 of 13

Drilling Company: See info on	Drilling Rig:	Bit Type:	Start Date:
Drillers (day / night): first page of	Drilling Method:	Logged by:	Finish Date:
Field Representitive (day / night): Log	Core Diameter:		Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
70						No Recovery			
71									
72									
73					ML	same as above, black organic matter (20%)			
74					CL SP-SM	CLAY (CL) lense w/ silt and sand, mod to high plasticity Poorly graded SAND with silt and gravel (SP-SM), dark yellowish brown (10YR 4/4), loose, moist, coarse gravel (30%), coarse sand, fine grained sand cobble			
75					CH	Fat CLAY (CH) dark yellowish brown (10YR 4/4), medium stiff to stiff, dry to moist, laminated with black organic matter and FE staining			
76	B5-75.0-77.6 (GS) 13-Nov-2016								
77									
78					SP-SM CH	Poorly graded SAND with silt (SP-SM), dark yellowish brown (10YR 4/4), loose, moist, non plastic, fine-grained sand CH, same as above			
79					SP-SM	SP-SM, same as above, dark yellowish brown (10YR 4/6), moist to wet			
80					SC-CL	Clayey SAND (SC) to sandy clay (CL), dark yellowish brown (10YR 4/4), loose, soft, moist to wet, medium to high plasticity			

COARSE-GRAINED SOILS <50% passes #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines — GW
			Poorly-graded[1] gravels, gravel-sand mixtures, little or no fines — GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[1] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[1] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[1] sands, gravelly sands, little or no fines — SW
			Poorly-graded[1] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[1] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[1] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
			Organic silts and clays of medium to high plasticity — OH
HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content — PT

CONSISTENCY (Silts and Clays)

Term	(SPT) 1.4"ID	Blows/ft* 2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	(SPT) 1.4"ID	Blows/ft* 2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

[1]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY: Nonplastic, Low, Medium, High

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

▽ Depth to first water (time and date)

▼ Depth to water after drilling (time and date)

MWH	Client: GE / UNC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B5 Sheet 9 of 13

Drilling Company: See info on first	Drilling Rig:	Bit Type:	Start Date:
Drillers (day / night): Page of Log	Drilling Method:	Logged by:	Finish Date:
Field Representitive (day / night):	Core Diameter:		Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	qu (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
80		3	0			No recovery			
		3	0		SP	Poorly graded SAND (SP), yellowish brown (10YR 5/4), loose, wet			
81		4	0						
82					SP-SM	Poorly graded SAND with silt (SP-SM), same as 77.6'			
83					CH	Fat CLAY with sand (CH), same as 75', trace black organic matter, Fe staining (10%)			
84					CL	Sandy CLAY (CL), yellowish brown (10YR 5/6), soft, moist, medium plasticity			
					CH	Same as 83.3, very dark brown (10YR 2/2), laminated with yellowish brown (10YR 5/6) lenses			
85						No recovery			
					SM	Silty SAND (SM), dark yellowish brown (10YR 4/4), loose, wet, predominantly fine sand			
86					CH	Same as above 83.3'			
87					SM	Silty SAND (SM), same as above, trace clay			
					CH	Fat CLAY (CH), same @ 75', yellowish brown (10YR 5/6)			
88									
89					SM	Silty SAND, same as above			
90									

MOD-CAL 2" ID

COARSE-GRAINED SOILS (More than half of material is larger than #200 sieve)	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines	GW
			Poorly-graded[1] gravels, gravel-sand mixtures, little or no fines	GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[1] gravel-sand-silt mixtures	GM
			Clayey gravels, poorly-graded[1] gravel-sand-clay mixtures	GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[2] sands, gravelly sands, little or no fines	SW
			Poorly-graded[2] sands, gravelly sands, little or no fines	SP
		SANDS with >15% fines	Silty sands, poorly-graded[2] sand-gravel-silt mixtures	SM
			Clayey sands, poorly-graded[2] sand-gravel-clay mixtures	SC
FINE-GRAINED SOILS (More than half of material is smaller than #200 sieve)	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity	ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	CL
			Organic silts and clays of low plasticity	OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt	MH
			Inorganic clays of high plasticity, fat clays	CH
			Organic silts and clays of medium to high plasticity	OH
	HIGHLY ORGANIC SOILS		Peat, humus, swamp soils with high organic content	PT

[1]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below:

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

PLASTICITY

Nonplastic	
Low	
Medium	
High	

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

▽ Depth to first water (time and date)

▼ Depth to water after drilling (time and date)

MWH	Client: GEIONC	SOIL BORING LOG FORM	BOREHOLE No.: B5
	Project Number:		Sheet 10 of 13

Drilling Company: See info on first	Drilling Rig:	Bit Type:	Start Date:
Drillers (day / night): Page of coe,	Drilling Method:	Logged by:	Finish Date:
Field Representitive (day / night):	Core Diameter:		Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
90						N. recovery			
91									
92					SM	Silty SAND (SM), yellowish brown (10YR 5/4), loose, wet, predominantly fine sand			
93					SP	Poorly graded sand (SP), yellowish brown (10YR 5/6) loose, wet, trace organic lamination			
94	B5-93.1-95.0 (GS) 13-Nov-2016								
95						No recovery			
96									
97									
98					CH	Fat CLAY with sand (CH), same as 83.3'		*driller notes wavering sands	
99					SM	Silty SAND (SM), same as above			
100									

COARSE-GRAINED SOILS >50% passes #200 sieve			
GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines	GW
		Poorly-graded[1] gravels, gravel-sand mixtures, little or no fines	GP
	GRAVELS with >15% fines	Silty gravels, poorly-graded[1] gravel-sand-silt mixtures	GM
		Clayey gravels, poorly-graded[1] gravel-sand-clay mixtures	GC
SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[1] sands, gravelly sands, little or no fines	SW
		Poorly-graded[1] sands, gravelly sands, little or no fines	SP
	SANDS with >15% fines	Silty sands, poorly-graded[1] sand-gravel-silt mixtures	SM
		Clayey sands, poorly-graded[1] sand-gravel-clay mixtures	SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50	Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity	ML
		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	CL
		Organic silts and clays of low plasticity	OL
	SILTS AND CLAYS liquid limit >50	Inorganic silts, micaceous or diatomaceous fine sand or silt	MH
		Inorganic clays of high plasticity, fat clays	CH
		Organic silts and clays of medium to high plasticity	OH
HIGHLY ORGANIC SOILS		Peat, humus, swamp soils with high organic content	PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

[1]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY: Nonplastic, Low, Medium, High

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

Depth to first water (time and date)

Depth to water after drilling (time and date)

MWH	Client: GS/UWC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B5 Sheet 11 of 13

Drilling Company: See info on first	Drilling Rig:	Bit Type:	Start Date:
Drillers (day / night): Page of log	Drilling Method:	Logged by:	Finish Date:
Field Representitive (day / night):	Core Diameter:		Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
100	MOP-QU 2"ID	7	0			No recovery			
		4	6		SM	same as above			
101	B5-101.0-101.5 (SSO) 13-Nov-2016	8	12						
						No recovery			
102									
103									
					CL	Sandy CLAY(CL), brown (10YR 4/3) medium stiff, moist to wet, fine-grained sand, medium plasticity, laminated w/ black organic matter			
104					SM	Silty sand (SM), same as above, brown (10YR 4/3), wet			
					CL	Sandy CLAY (CL), same as above			
105						No recovery			
106									
107									
108					CL	Sandy CLAY (CL), same as above			
					SM	Silty SAND (SM), same as above			
109									
110									

COARSE-GRAINED SOILS >50% retained #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines — GW
			Poorly-graded[1] gravels, gravel-sand mixtures, little or no fines — GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[1] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[1] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[1] sands, gravelly sands, little or no fines — SW
			Poorly-graded[1] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[1] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[1] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
			Organic silts and clays of medium to high plasticity — OH
HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content — PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

[1]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY: Nonplastic, Low, Medium, High

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

Depth to first water (time and date)

Depth to water after drilling (time and date)

MWH	Client: GE/UNC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B5 Sheet 12 of 13

Drilling Company: See info on first	Drilling Rig:	Bit Type:	Start Date:
Drillers (day / night): Page of log,	Drilling Method:	Logged by:	Finish Date:
Field Representitive (day / night):	Core Diameter:		Total Depth:

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
110					CL	Silty CLAY(CL), dark yellowish brown (10YR 4/4) moist, soft, medium to high plasticity, laminated w/ Fe oxidation and black organic matter (5-10%)			
111					CL	Sandy CLAY(CL), same as above			
112					CL	Silty CLAY(CL), same as above			
						Same as above, wet, trace fine-grained sand			
113									
114						same as above, moist			
					CL	Sandy CLAY (CL), same as above, moist			
115						No recovery			
116					CL	Silty CLAY(CL), moist to wet			
117									
118					ML	Sandy SILT(ML) to silty SAND(SM), yellowish brown (10YR 5/4), clay (10-15%)			
119									
120									

COARSE-GRAINED SOILS >50% passes #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS with little or no fines	Well-graded[1] gravels, gravel-sand mixtures, little or no fines — GW
			Poorly-graded[1] gravels, gravel-sand mixtures, little or no fines — GP
		GRAVELS with >15% fines	Silty gravels, poorly-graded[1] gravel-sand-silt mixtures — GM
			Clayey gravels, poorly-graded[1] gravel-sand-clay mixtures — GC
	SANDS <50% coarse fraction passes #4 sieve	SANDS with little or no fines	Well-graded[1] sands, gravelly sands, little or no fines — SW
			Poorly-graded[1] sands, gravelly sands, little or no fines — SP
		SANDS with >15% fines	Silty sands, poorly-graded[1] sand-gravel-silt mixtures — SM
			Clayey sands, poorly-graded[1] sand-gravel-clay mixtures — SC
FINE-GRAINED SOILS >50% passes #200 sieve	SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity — ML
			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays — CL
			Organic silts and clays of low plasticity — OL
	SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt — MH
			Inorganic clays of high plasticity, fat clays — CH
			Organic silts and clays of medium to high plasticity — OH
HIGHLY ORGANIC SOILS			Peat, humus, swamp soils with high organic content — PT

CONSISTENCY (Silts and Clays)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)

Term	Blows/ft* (SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

[1]Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY: Nonplastic, Low, Medium, High

MOISTURE

Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION

Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

GRAIN SIZE

Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

Depth to first water (time and date)

Depth to water after drilling (time and date)

MWH	Client: GE/UNC Project Number:	SOIL BORING LOG FORM	BOREHOLE No.: B5 Sheet 13 of 13

Drilling Company: See info on first	Drilling Rig:	Bit Type:	Start Date:
Drillers (day / night): Page of log	Drilling Method:	Logged by:	Finish Date:
Field Representitive (day / night):	Core Diameter:		Total Depth: 125

Depth	Sample Number	Blow Count	Recovery (in.)	q_u (tsf)	Lithology / Symbol	Description	Graphic	Remarks	Well Details
120	MOD-CAL 2" ID	3	3"		NR SM	silty SAND (SM), brown (10YR 4/3)			
		6	6						
121		9	6			grades to brown (10YR 5/3), clay (10%)			
						No recovery			
122					SM	silty SAND (SM)			
123						grades with increasing clay (5-10%)			
					CL SM CL SM CL SM CL	silty CLAY (CL), as above INTERBEDDED CLAY (CL) and silty SAND (SM) as described above			
124									
125								TD 125' END AT 1620	

FINE-GRAINED SOILS (<50% passes #200 sieve)			
SILTS AND CLAYS liquid limit <50		Inorganic silts/very-fine sands, silty or clayey fine sands, silts with slight plasticity	ML
		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	CL
		Organic silts and clays of low plasticity	OL
SILTS AND CLAYS liquid limit >50		Inorganic silts, micaceous or diatomaceous fine sand or silt	MH
		Inorganic clays of high plasticity, fat clays	CH
		Organic silts and clays of medium to high plasticity	OH
HIGHLY ORGANIC SOILS		Peat, humus, swamp soils with high organic content	PT

CONSISTENCY (Silts and Clays)		Blows/ft*	
Term	(SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very soft	0-2	0-2	0-2
soft	2-4	2-4	2-4
medium stiff	4-8	4-8	4-8
stiff	8-15	9-17	9-18
very stiff	15-30	17-39	18-42
hard	30-60	39-78	42-85
very hard	>60	>78	>85

DENSITY (Sands and Gravels)		Blows/ft*	
Term	(SPT) 1.4"ID	2.0"ID	(modCAL) 2.5"ID
very loose	0-4	0-5	0-7
loose	4-10	5-12	7-18
medium dense	10-30	12-37	18-51
dense	30-50	37-60	51-86
very dense	>50	>60	>86

* = 140 pound hammer dropped 30 inches

*Note: Well-graded = poorly sorted; Poorly-graded = well sorted

PLASTICITY
Nonplastic
Low
Medium
High

MOISTURE	
Term	Field Test
Dry	Absence of moisture, dry to touch
Moist	Damp, does not wet palm
Wet	Visible Free Water

CEMENTATION	
Term	Field Test
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

GRAIN SIZE		
Term	Size (mm)	Size (inches)
Boulders	>300	>12
Cobbles	75 to 300	3 to 12
Coarse gravel	19 to 75	3/4 to 3
Fine gravel	4.75 to 19	3/16 to 3/4
Coarse sand	2.0 to 4.75	1/16 to 3/16
Medium sand	0.425 to 2.0	1/64 to 1/16
Fine sand	0.075 to 0.425	0.003 to 1/64
Silt / clay (fines)	<0.075	<0.003

SOIL TYPE MODIFIERS

Percentages of gravel, sand, and fines may be stated in terms indicating a range of percentages as below.

Term	%
Trace	<5
Few	5-10
Little	15-25
Some	30-45
Mostly	50-100

Depth to first water (time and date)

Depth to water after drilling (time and date)