

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

Borehole ID: NC-GWE-PV-1 Drill Depth From: 0.0 to 610' Page: 1 of 7

Driller: Evan Barto/Ray Wilson Start Date/Time: 11/16/10 at 1610 End Date/Time: 12/21/10 at 1005

Drilling Equip./Method: Bucket Auger/16" Auger Speedstar 50K/Conventional Air-Foam Sampling Equip. Method: Auger/Cyclone Collector

DEPTH (FEET)	Drilling Time (min/5 ft)	DESCRIPTION OF LITHOLOGY-PETROLOGY	GRAPHIC LOG	LITHOLOGIC UNIT	NOTES
0	85	<p>0 to 20 ft Silty Gravel with Sand (GM): yellowish-brown (10YR 5/4), 35% cobbles and boulders up to 12", 15% fine to coarse gravels, 25% fine to medium to coarse sand, 20% silt, 5% clay. Clasts are subrounded to subangular and composed predominantly of quartzite with lesser limestone (10%) and minor conglomerate (less than 5%). Clasts have 1-2 mm thick calcium carbonate coatings. Material is loose, dry, with no cement. Reacts strongly to 10% HCl. Clay has moderate plasticity.</p> <p>@ 8 to 11 ft: fewer cobbles and boulders.</p> <p>@ 11 to 15 ft: quartzite boulder beds.</p> <p>@ 14 ft: clay content increases to 10%.</p>		Qal	<p>All colors logged wet. Loose dry materials cave into borehole.</p> <p>Coarse grained materials make augering difficult.</p> <p>Refusal of auger at 15 ft. Set 10 3/4" surface casing at 14.2 ft.</p> <p>Bit chattering on large cobbles. Possibly boulders.</p> <p>Bit grinding on gravels.</p>
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					
55					
60					
65					
70					
75	15	<p>20 to 610 ft Well Graded Gravel with Sand (GW): weak red (2.5YR 4/2) 75% fine to coarse gravel up to 3/4" in size, 25% medium to coarse sand, clasts are subangular to subrounded and are predominantly composed of quartzite with lesser siltstone (2%) and some sandstone (4%), clasts have up to (5mm) coatings. Reacts strongly to 10% HCl. Also contains (1mm) black limestone clasts.</p> <p>@ 30 ft gravels decrease in size to 1/4".</p> <p>@ 35 ft gravels increase in size to 3/4".</p>			
80					
85					
90					
95					
100					
105					
110					
115					
120					
125					
130					
135					
140					
145					
150	10	<p>@ 85 ft gravel decrease in size to 1/2".</p> <p>@ 90 ft gravels increase in size to 3/4".</p>			
155					
160					
165					
170					
175					
180					
185					
190					
195					
200					
205					
210					
215					
220					

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DEPTH (FEET)	Drilling Time (min/5 ft)	DESCRIPTION OF LITHOLOGY-PETROLOGY	GRAPHIC LOG	LITHOLOGIC UNIT	NOTES
110	5			Qal.	Bit chattering on cobbles. Possibly boulders.
	8				
	4	@ 110 ft gravels decrease in size to ¼".			
	3				@ 115 ft poor recovery.
120	3	@ 120 ft gravels increase in size to ¾".			
	4				
130	10	@ 130 ft gravels decrease in size to ¼".			
	16				
140	27	@ 140 ft encountering hard well-cemented layer. Gravels are ¼" in size.			@ 140 ft drilling slower.
	5				
150	4	@ 150 ft formation is softer.			@ 150 ft drilling faster.
	4				
160	5	@ 160 ft gravels increase in size to 1".			
	4	@ 165 ft gravels decrease in size to ¾".			
170	4				
	7				@ 175 ft poor circulation, poor recovery.
180	3				
	3				
190	9				
	9				@ 195 ft slow hard drilling, Probably boulder. Poor circulation.

PREPARED BY: Jim Foster DATE: 1/7/2011 CHECKED BY: Bob Wilcoxon DATE: 2/6/2011

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DEPTH (FEET)	Drilling Time (min/5 ft)	DESCRIPTION OF LITHOLOGY-PETROLOGY	GRAPHIC LOG	LITHOLOGIC UNIT	NOTES
210	9	@ 200 ft gravels increase in size to 1".		Qal.	
	25				@ 208 ft trip out bit. Cone broken off bit, drilling hard quartzite rock. Bit is pulverizing the gravel clasts. Cementation appears to be silica.
	40	@ 210 ft gravels decrease in size to 3/4".			
	15				@ 215 ft bit is pulverizing gravel clasts to sand.
220	19				
	36				
230	33				
	12				
240	16				
	8				@ 245 ft well-cemented formation.
250	24				@ 250 ft poor circulation. Based on various drill rates there appears to be different densities in the formation.
	17				
260	36				
	36				
270	6				@ 270 ft drilling faster, formation is less dense.
	6				
280	11				
	11				
290	6				
	13				@ 298 ft lost circulation.

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DEPTH (FEET)	Drilling Time (min/5 ft)	DESCRIPTION OF LITHOLOGY-PETROLOGY	GRAPHIC LOG	LITHOLOGIC UNIT	NOTES
310	7	@ 300 ft clay increases from 0% to 5%.		Qal.	
	17	@ 305 ft clay is absent.			
	5				@ 310 ft drilling faster, softer formation.
	11				@ 316 ft drilling slower.
	8				
	18				
	5				@ 330 ft drilling faster. Softer layer.
	5				
	7				@ 340 ft poor return.
	15				@345 ft drilling slowed.
	3				@ 350 ft lost circulation. Drilling faster.
	8				
	3				@ 360 to 365 ft poor recovery.
	8				
	5				
	5				@ 375 to 380 ft poor circulation.
	5				@ 380 ft lost circulation.
	7				
	6				
	5				

PREPARED BY: Jim Foster DATE: 12/19/2010 CHECKED BY: Bob Wilcoxon DATE: 2/6/2011

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DEPTH (FEET)	Drilling Time (min/5 ft)	DESCRIPTION OF LITHOLOGY-PETROLOGY	GRAPHIC LOG	LITHOLOGIC UNIT	NOTES
410	6	@ 405 ft Gravels decrease to 55%, sand increases to 45%.		Qal.	Drilling continues faster. Softer formation.
	4				
	4				
420	5				
	6				
	7				
430	7				
	4				
440	4				
	4				
450	4				
	5				
	8				
460	5				@ 460 ft lost circulation.
	4				
470	5				@ 470 ft poor recovery.
	5				@ 475 ft poor recovery.
480	13				
	2				
490	2				@ 490 ft poor recovery.
	4				@ 500 ft poor recovery.

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	6			Qal.	
510	3				@ 505 ft no recovery, lost circulation zone.
	4				@ 510 ft regain circulation.
					@ 510 to 535 ft no recovery.
520	3				
	7				
	4	@525 ft 35% sandstone clasts with fine to medium-grained textures and the appearance of chips of silica fracture fill from 525 to 610 ft.			
530	5				
	2				
540	3	@ 540 to 570 ft gravels decrease to 55%. Sand increases to 45%.			@ 540 ft no recovery.
					@ 545 ft poor recovery.
550	3				@ 550 to 565 ft no recovery.
	2				
	2				
560	3				
	5	@565 to 570 ft 10% sandstone clasts.			
570	2	@ 570 ft sandstone clasts decreases to 4%.			
	3				
580	4				@ 580 ft lost circulation. No recovery.
					@ 585 ft no recovery.
590	4				@ 590 ft sign of water.
	3				
	3				@ 595 to 609.1 ft poor recovery.

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