NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE **CUTTINGS SAMPLE LOG** Drill Depth From: 0 to 367 Page: 1 of 4 Borehole ID: NC-GWE-Felderhoff-25-1PA Driller: Bill Nelson/Ray Wilson_____ Start Date/Time: 05/18/2010 @_16:15__ End Date/Time: 5/30/2010 @ 08:58__ Drilling Equip./Method: Ford Bucket/Auger and Speedstar 50k/Conventional Air-Foam Sampling Equip. Method: Auger to 20 ft/Cyclone from 20 to 367 ft. LITHOLOGIC **GRAPHIC LOG Drilling Time DEPTH NOTES** (FEET) **DESCRIPTION OF LITHOLOGY-PETROLOGY** From 0 to 15 ft poorly-graded sand with gravel SP: Light brown (5YR 6/4), 25% medium Moist from 0 to 17 ft. Qal Material is SP from 0-15 ft. grained sand, 25% gravel, sub-angular composition is tuff, weak cement, strong reaction to 18 HCl, gravels are fine grained, $\frac{1}{2}$ inch material is slightly moist @ 4 ft: Moisture increases. @ 6 ft: Gravels size increases to 1 inch, gravel percentage increases to 30%. Increasing gravel size and percentage. @ 7 ft: Moisture decreases to slight. 30 @ 9 ft: Gravel content increases to 35%. 10 @ 11 ft: A few gravels up to 2 ½ inches; From 15 to 16 ft well-graded sand with gravel (SW), light brown (5YR 6/4), fine to medium sand, 35 25% gravel up to 1 % inches, sub-angular, gravel clasts composed of tuff, minor silt $^{\sim}$ 3-5%, slightly moist, a few gravel clasts up to 3 inches; From 16 to 17 ft well-graded sand with silt and gravel (SW-SM): Light brown (5YR 6/4), 10% silt, 25% gravel up to 1 ½ inches, sub-angular, tuff clasts, weak cement, strong reaction to HCl acid, slightly moist; (SW) at 15-16 ft with gravel. (SW-SM) at 16 ft with gravel. 50 SM at 17 ft with gravel, dry @ 17 ft. From 17-20 ft silty sand with gravel (SM): Pale greenish-yellow (10YR 8/2), 35% silt, 40% fine to medium coarse sand 25% gravels up to 1 ½ inches a few cobbles, up to 3 inches, dry. 20 From 20 to 65 ft: Well-graded gravel with sand (GW); Moderate yellowish-brown Set 10 ft casing at 20 ft. Begin air foam drilling @ 20 ft. (10YR 5/4), 55% fine to coarse gravels, 45% sand, sub angular, composed of ash-flow 2 Fines are lost due to wet drilling. tuff, HCl strong, no cementation. @ 30 ft: Gravel increase to 75%, gravels up to 1 inch. 4 30 4 11 40 @ 40 ft: Sand decreases to 10%. 6 Rod change. 6 50 2 @ 50 ft: Sand increases to 30%, gravels decrease in size to $\frac{1}{2}$ inch. @ 55 ft: Sand increases to 20%, gravel increases to $\frac{3}{4}$ inch. 2 60 @ 60 ft: Sand increases to 35%, gravels increase to 1 inch. 2 From 65 to 70 ft: Well-graded sand with gravel (SW): Light brown (5YR 6/4), 65% sand, @ 65 ft: Clean out contamination. 35% gravels up to 1 inch, gravels are sub-rounded to sub-angular, composed of 4 predominantly ash-flow tuff and minor basalt (<2%). 70 From 70 to 150 ft: Well-graded gravel with sand (GW); Pale yellowish -brown (10YR 6/2), 70% gravel, 30% sand, gravel up to ¾ inch, sub-angular to angular, HCl strong, no cementation, gravels are composed of ash-flow tuff. 80 @ 80 ft: Sand increases to 45%. 4 90 @ 90 ft: Sand decreases to 25%. 3 @ 100 ft: Sand increases to 45%. 3 Qal PREPARED BY: Jim Foster/Bob Wilcoxon DATE: 05/29/2010 CHECKED BY: Bob Wilcoxon DATE: 05/31/2010

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE **CUTTINGS SAMPLE LOG CONTINUATION** Drill Depth From: 0 to 367 ft Page: 2 of 4 Borehole ID: <u>NC-GWE-Felderhoff-25-1PA</u> LITHOLOGIC **GRAPHIC LOG Drilling Time** (min/5 ft) **DEPTH NOTES DESCRIPTION OF LITHOLOGY-PETROLOGY** (FEET) All samples are wet due to wet drilling. Qal 4 4 110 2 @ 115 ft: Gravels increase to 1 inch, sand decreases to 30%. 3 120 @ 120 ft: gravels increase to 90%. 3 @ 125 ft: Sand increases to 40%. 6 130 @ 130 ft: Gravel size decreases to ½ inch. 4 @ 135 ft: Sand increases to 45%. 4 140 3 @ 145 ft: 10% Clay. 6 150 From 150 to 190 ft: Well-graded sand (SW), light brown (5YR 6/4), 10% fine gravel to $\mbox{\%}$ inch, 90% sand, gravel sub-round to sub-angular, predominantly ash-flow tuff with minor basalt 6 (<2%), HCl strong, no cementation, thick grain coating on gravel clast (5ml). 3 160 3 @ 165 ft: Sand decreases to 55%. 7 170 @ 170 ft: Sand increases to 60%. Clean out contamination 175 to 180 ft. 3 180 @ 180 ft: Some rounding of gravels (<2%). Clean out contamination 185 to 190 ft. 4 190 From 190 to 230 ft: Clayey gravel (GC); Moderate yellowish-brown (10YR 5/4), 50% Poor return from 190 to 197 ft. fine gravel to $\mbox{\em 1}\mbox{\em 1}$ inch, 35% sand, 15% clay, gravel is sub-angular, gravels are composed 4 of ash-flow tuff, clay has low plasticity, HCl strong, no cementation. \\

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DEPTH				CUTTINGS SAMPLE I	.OG				CONTINUATION
2		Boreh	ole ID: _	NC-GWE-Felderhoff-25-1PA Drill Depth From: 0	to		367 f	t Page <u>:</u>	<u>3</u> of <u>4</u>
2									
2			Drilling Time (min/5 ft)	DESCRIPTION OF LITHOLOGY-PETROLOGY	GRAPHIC LOG	LITHOLOGIC	LIND		NOTES
2 2 2 2 2 2 2 2 2 2			3	@ 200 ft: Gravel increases 65%, sand 25%, clay 10%.		С	al		
2 2 2 2 2 2 2 2 2 2									
2 2 2 2 2 2 2 2 2 2	210		4					Poor circulation, or	nly gravels in return 210 to 220 ft
220 230 TE Greet Processed to 77%, no clay. 230 250 TE Greet Secretary Secr		=	2					Tool circulation, or	The first of the f
2 0 25 S. 1. Created discreases to 75%, for Cost. 2 0 25 S. 1. Created discreases to 75%, for Cost. 2 0 25 S. 1. Created discreases to 75%, sund 13%; sund 3%; sund 10% sund. 3 10%, sub-amplier, 10% send, 20% slay, our pleasinity, grands compared of sule flow sund. 3 10%, sub-amplier, 10% send, 20% slay, our pleasinity, grands compared of sule flow sund. 2 10% sub-amplier, 10% send, 20% slay, our pleasinity, grands compared of sule flow sund. 2 2 10% send, respectively. 2 2 10% send, respectively. 2 3 2 10% sub-amplier, 10% send, 20% slay, supplementation, grands considered display flow suff. 3 3 10% slay, for compared and sub-amplier, grands considered display flow suff. 3 4 20% start display flowed displayed and with panel (20%, grand social respective). 2 5 5 2 2 2 3 3 3 10% slay, flowed displayed and with panel (20%, grand social respective). 2 6 2 2 3 4% start displayed and with panel (20%, grand social respective). 3 7 2 2 3 3 4% refer see caused 20%, send increase to 20%, care six send social respective to send social respe			2						
2	220		2	@ 220 ft: Gravel increases to 75%, no clay.					
18%, u.oequilar, 17% Long. 19% Lon			2	@ 225 ft: Gravel decreases to 65%, sand 33%, clay 2%, HCl weak.					
2	230		3	10%, sub-angular, 70% sand, 20% clay, low plasticity, gravels composed of ash-flow					
2 65% sub-sequency 23% and, 2% cap by epitaticity, gravels composed of abir-flow tall, HCL week, no correctation, gravels up to 1 inch. 2 9/45 ft. Gravel decreases to 595, 3/4 inch size, and increases 40%, day increases to 505, 3/4 inch size, and increases 40%, day increases to 505, 3/4 inch size, and 5/50, and increases 40%, day increases to 506, 3/4 inch size, and 5/50, and increases 40%, day increases to 5/50, 3/4 inch size, and 2/50, no cap, gravel sub-angular to angular, gravels are address to 5/50, and increase to 5/50, sand increase to 3/50, clay 2%. 2 9/26 ft. Gravels increase to 5/50, sand increase to 3/50, clay 2%. 2 2 9/27 ft. Gravels increase to 7/50, sand decreases to 2/50, clay 2%. 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			3						
2 5%. 2 75%. 2 8 75%. 2 9 275 ft: Gravels increase to 50%, sand increase to 38%, clay 2%. 2 9 275 ft: Gravels increase to 50%, sand increase to 38%, clay 2%. 2 9 275 ft: Gravels increase to 50%, sand increase to 38%, clay 2%. 2 9 275 ft: Gravels increase to 57%, sand decreases to 52%, clay 2%. 2 9 275 ft: Gravels increase to 75%, sand decreases to 52%, clay 2%. 2 9 275 ft: Gravels increase to 75%, sand decreases to 50%, fight brown (57% 5/6) gravel 5%, size 3/2 inch, sub-counded sub-angular, sand 90%, clay 5%, ft: 0 seeks, no commentation. 2 9 285 ft: Gravel increases to 25%, sand decreases to 70%, clay 5%. 2 9 286 ft: Gravel increases to 25%, sand decreases to 70%, clay 5%. 2 9 285 ft: Gravel increases to 25%, sand decreases to 70%, clay 5%. 2 9 285 ft: Gravel increases to 25%, sand decreases to 70%, clay 5%. 2 9 285 ft: Gravel increases to 25%, sand decreases to 70%, clay 5%. 2 10 6 285 ft: Gravel increases to 25%, sand decreases to 70%, clay 5%. 2 10 7 5 from 280 to 240 ft, Well graded gravel with clay and sand (GW-GC, light brown (578 gravel) commentation. 2 10 8 285 ft: Gravel increases to 25%, sand decreases to 70%, clay 5%. 2 2 6 285 ft: Gravel increases to 25%, sand decreases to 70%, clay 5%. 2 3 5 from 280 to 240 ft, Well graded gravel with clay and sand (GW-GC, light brown (578 gravel) composed of predominantly ab-flow toff with minor black vesicular based at 173%, if 10 clay, no cerementation. 2 9 25 ft: Clay decreases to 5%.	240		2	65% sub-angular, 33% sand, 2% clay low plasticity, gravels composed of ash-flow tuff,					
260 270 280 280 290 290 200 200 200 20	_		2						
200 Prom 260 to 280 ft, Well-graded gravel with sand (GW), light brown (SYR 5/6). Gravel 79% up to 3/4 inch size, sand 25%, no day, gravel sub-angular to angular, gravels are ash-flow tuff, HCl weak, no cementation. 2	250		2						
20			3						
2	260		4	75% up to 3/4 inch size, sand 25%, no clay, gravel sub-angular to angular, gravels are					
280 280 280 280 280 280 290 290			2	@ 265 ft: Gravels decrease to 60%, sand increase to 38%, clay 2%.					
280 From 280 to 290 ft, Well-graded sand with gravel (SW), light brown (SYR 5/6) gravel 5%, size 1/2 inch, sub-rounded sub-angular, sand 90%, clay 5%, HCl weak, no cementation, clay low plasticity. 8 285 ft: Gravel increases to 25%, sand decreases to 70%, clay 5%. From 290 to 340 ft, Well-graded gravel with clay and sand (GW-GC), light brown (SYR 5/6). Gravel 60%, 3/4 inch size, sub-rounded to sub-angular, sand 30%, clay 10%, low plasticity, gravel composed of predominantly ash-flow tuff with minor black vesicular basalt (<3%), HCl weak, no cementation. 8 295 ft: Clay decreases to 5% Qal	270		2						
290 290 From 290 to 340 ft, Well-graded gravel with clay and sand (GW-GC), light brown (5YR 5/6). Gravel 60%, 3/4 inch size, sub-rounded to sub-angular, sand 30%, clay 10%, low plasticity, gravel composed of predominantly ash-flow tuff with minor black vesicular basalt (<3%). HCl weak, no cementation. 2	200		2					Poor return @ 27	'5 to 280 ft.
2 From 290 to 340 ft, Well-graded gravel with clay and sand (GW-GC), light brown (5YR 5/6). Gravel 60%, 3/4 inch size, sub-rounded to sub-angular, sand 30%, clay 10%, low plasticity, gravel composed of predominantly ash-flow tuff with minor black vesicular basalt (<3%), HCl weak, no cementation. @ 295 ft: Clay decreases to 5% Qal	280		1	5%, size 1/2 inch, sub-rounded sub-angular, sand 90%, clay 5%, HCl weak, no					
2 5/6). Gravel 60%, 3/4 inch size, sub-rounded to sub-angular, sand 30%, clay 10%, low plasticity, gravel composed of predominantly ash-flow tuff with minor black vesicular basalt (<3%), HCl weak. no cementation. @ 295 ft: Clay decreases to 5% Qal			10	@ 285 ft: Gravel increases to 25%, sand decreases to 70%, clay 5%.					
300 <u></u>	290		2	5/6). Gravel 60%, 3/4 inch size, sub-rounded to sub-angular, sand 30%, clay 10%, low plasticity, gravel composed of predominantly ash-flow tuff with minor black vesicular		-			
PREPARED BY: Jim Foster/Bob Wilcoxon DATE 05/29/2010 CHECKED BY: Bob Wilcoxon DATE: 05/31/2010	300		1	@ 295 ft: Clay decreases to 5%		С	▼ (al		
			PREPAR	ED BY: <u>Jim Foster/Bob Wilcoxon</u> DATE <u>05/29/2010</u> CHECK	ED BY: <u>Bob</u>	Wild	coxon	n DATE: <u>05</u> ,	/31/2010

DEPTH (FEET)	Drilling Time (min/5 ft)	NC-GWE-Felderhoff-25-1PA	Drill Depth From:		Š	367 f	t Page <u>: 4</u> of 4
	Drilling Time (min/5 ft)						
		DESCRIPTION OF LITHO	LOGY-PETROLOGY	GRAPHIC LOG	LITHOLOGIC	UNIT	NOTES
	1	@ 305 ft: No clay, gravels increase to 70%, Basa	alt decreases to 1%.		Q	al	
310	- - 2						
	7	@ 315 ft: Gravels decrease to 50%, sand increa	ses to 50%.				
=	2						
320	2	@ 320 ft: Gravel increases to 65%, sand decrea	ses to 37%, clay to 3%.				
=	7						@ 325 to 330 ft rod changed. Fines were washed out.
330	- - - 4	@ 330 ft: Gravel decreases to 45%, sand increa	ses to 45%, Clay 10%.				
	4	@ 335 ft: Gravel increases to 49%, sand increas	es to 49%, clay decreases to 2 %.				
340	4	@ 340 to 366.8 ft: Drilling boulders.					@ 342 to 366.8 ft: Poor recover due to boulders and lots of water production washing out fines.
<u>-</u> -	4						
350	19						
<u>=</u> =	-						
360	- 6 - -						
366.8	2	TD			Q	, al	TD at 366.8 ft.
	-						
0	-						
0	- - - -						
=	-						
	-						
0	-						
0	- - -						