

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

Borehole ID NC-EWDP-19D Drill Depth From 354.95' To 375 Page 1 of 18
 Driller M. Boyd / R. Shuler Start Date/Time 3/29/00 1645 End Date/Time 4/2/00 1800 hrs
 Drilling Equip./Method Auger 0-39.5' Cabot Flooded reverse-Mud 39.5-355.0' 1R75E Reverse circulation-Air 355.0-1438.32' (T.D.) Sampling Equip./Method Cyclone/splitter/tiered buckets
 Notes: Auger - no samples Cabot - no samples see NC-EWDP-19P

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	Lithologic Unit	Notes
0		From 0.0 to 39.5' Drilled with Auger Rig. No SAMPLE TAKEN. For lithologic description see "CUTTINGS SAMPLE LOG" for NC-EWDP-19P (drilled on 1/99).			*Note: Interval 355-657 was drilled with a mill tooth tricone bit; consequently, all particle size greater than 1/4" is ground up.
50					
100					
150					
200					
250					
300					
350		From 39.5 to 355.0' Drilled with Cabot Reverse MUD RIG. No SAMPLE TAKEN. For lithologic descriptions see "CUTTINGS SAMPLE LOG" for NC-EWDP-19P			BEGW Drilling 3/29/00, 1645 NOTE: Depth scale on log changes at 350' from 50' to 5' per interval. Tagged cement plug in 16" casing @ 346.7'
355	BCS 0000	355-360' Gravel-sand mixture, pale red (10R6/2), wet from injection water, composed of a variety of volcanoclastic fragments ranging in color from pale brown, light brown, very pale orange, and pale green-yellow. No organics, no odor, no staining.			NOTE: Samples from 355 to approximately 500' are contaminated with bentonite mud from casing. Contamination decreases down hole. Sample 355-360' is likely contaminated with hole fill. Injecting water to lift cuttings ~5 gal/min to ~820' (Gentle Well water)
360	4776 20 min	360-365' Gravel-sand mixture, pale brown (5YR5/2), composed of the same volcanic fragments above. No organics, no odor, no staining. Drill rate is approximately 5 ft/20 min.			First water @ 366' as indicated by NC-EWDP-19P 25 MEN. No noticeable increase in water in ground water to less than injection water.
365	BCS 0000	365-370' Gravel-sand mixture as above. Depth to water after drilling = 366 ft.			Bentonite content decreasing at ~372 ft.
366	4777 20 min	370-375' Gravel-sand mixture; as above. No odor, no staining, no organics. Drill rate is steady at approximately 5 ft/20 min. Fragments are angular and drilling induced.			
370	BCS 0000				
375	4779 20 min				

QUALITY ASSURANCE RECORD

APR 26 2000

THIS IS A RED STAMP
DO NOT REMOVE FROM FILE

Prepared By B. Wilcox Date 3-29-00 Checked By ARTHUR J. Mendenhall Date 04-12-00

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

CONTINUATION

Borehole ID ENC-ENR-19D Drill Depth From 375 To 440 Page 2 of 18

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	LITHOLOGIC UNIT	Notes
375	BCS 0000 4780 20 min	<u>375-380</u> Gravel-sand mixture; moderate brown (5YR 8/2); wet from injection water; multi-colored volcanic fragments ranging from pale brown, light brown, very pale orange, and pale greenish-yellow. No odor/staining			Still Presence of BENTONITE mud contaminating sample @ 377' $\angle 1^\circ$ off vertical
380	BCS 0000 4781 15 min	<u>380-385</u> Gravel-sand mixture as above. Drill rate = 1 ft/3 min. Sample is wet from injection water. No organics, no odor, no staining.			As noted on PAGE 1, particle size and composition could not be determined.
385	BCS 0000 4782	<u>385-390</u> Gravel-sand mixture; light brown (5YR 6/4) wet from injection water; multi-colored volcanic tuff fragments as above; no organics, no odor, no staining. Drilling rate remaining relatively constant at 0.25 ft/min			Good drilling returns from cyclone sample collector; however, the presence of drilling mud removes fines from sample 387-389 coarse material, poss. boulders
390	BCS 0000 4783 20 min	<u>390-395</u> Gravel-sand mixture as above; light brown (5YR 6/4) to pale brown (5YR 5/2); wet from injection water; multi-colored tuff fragments, angular and coring induced; no organics, no odor, no staining; Drill rate increases to 0.25 ft/min			Bentonite drilling mud still contaminating sample
395	BCS 0000 4784	<u>395-400</u> Gravel-sand mixture as above; light brown to pale brown; wet from injection water; coring induced angular fragments; no organics, no odor, no staining; Drill rate constant at 0.25 ft/min			@ 387' Drill string jumping indicating coarse material. Sample splitter cut to down to 1/4 split.
400	BCS 0000 4785 20 min	<u>400-405</u> Gravel-sand mixture as above; Drilling rate = 0.33 ft/min. No organics, no odor, no staining; angular coring induced fragment			Drilling rate = 0.33 ft/min. Likely boulder bed at 400'
405	BCS 0000 4786 15 min	<u>405-410</u> Gravel-sand mixture as above; pale brown (5YR 5/2) to moderate brown (5YR 4/4); coring induced angular fragments, multi-colored ranging from moderate brown, dusky yellowish-brown, orange-pink, light gray			Drilling rate increases to 0.73 ft/min
410	BCS 0000 4787 7 min	<u>410-415</u> Gravel-sand mixture as above; same overall color; wet from injection water; angular coring induced fragments as above with the minor very dark red fragments present. Drilling rate constant at 0.73 ft/min			Still getting good returns 10+ gal of water & sample. Samples still contaminated with Bentonite mud.
415	BCS 0000 4788 7 min	<u>415-420</u> Gravel-sand mixture as above; pale red (10R 6/2) to grayish-red (10R 4/2); wet from injection water; same multi-colored volcanic tuff fragments as above; no odor, no staining, no organics; 22 min drill time due to lost circulation			Lost circulation after pause in drilling (10 min) due to deviations survey. Little to no return from 415-419 ft. Sample from interval 415-420 coarsens. Samples still contaminated with bentonite mud but bentonite is thinning. Good return restored at 420 ft.
420	BCS 0000 4789 22 min	<u>420-425</u> Gravel-sand mixture as above; Pale red to grayish red; same volcanic fragments above with slight increase in percentage of coarser fraction; Drill rate decreases noticeably to 0.13 ft/min			@ 420-425 great decrease in drill rate 0.38 ft/min
425	BCS 0000 4790 41 min	<u>425-430</u> Gravel-sand mixture as above. Pale yellowish-brown (10YR 6/2) to pale brown (5YR 5/2); some dark red hematitic staining on fracture surfaces; coarse fraction fining. Drill rate = 0.38 ft/min			425-430 drill rate improves to ~0.34 ft/min
430	BCS 0000 4791 13 min	<u>430-435</u> Gravel-sand mixture as above. Overall color as above. Minor Fe-ox staining present on a few fragments. Drill rate = 0.38 ft/min			
435	BCS 0000 4792 13 min	<u>435-440</u> Gravel-sand mixture as above. Same color overall and some multi-colored angular volcanic fragments; minor Fe-ox staining still present; Drill rate = 0.35 ft/min			435-440 very poor sample return, but restored at 441 ft. DEVIATION $1\frac{1}{4}^\circ$ 3-30-00/0145
440	11 min				Samples still contaminated

Prepared By Boris Wilcox Date 3-29-00 Checked By Arthur J. Mendez Date 04-12-00

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

CONTINUATION

Borehole ID NC-EWDP-19D Drill Depth From 440 To 505 Page 3 of 18

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	LITHOLOGIC UNIT	Notes
440	BCS 0000 4793	440-445 Gravel-Sand Mixture as above; Pale Red (SR 6/2) to moderate red (SR 5/4); same multi-colored volcanic fragments as above; minor Fe-ox staining; angular coring induced fragments			Good Returns Sample still contaminated but mud is thinning
445	13 MIN BCS 0000 4794	445-450 GRAVEL-SAND MIX AS ABOVE, PALE RED (10R 6/2) 3% WHITE FRAGMENTS (N9), HETEROGENEOUS MIX OF COLORED FRAGMENTS: REDS, GRAYS, VOLCANICS.			
450	13 MIN BCS 0000 4795	450-455 GRAVEL-SAND MIX AS ABOVE, PALE RED (10R 6/2)			END OF ROD, CIRCULATE FOR 10 MINUTES BEFORE DEVIATION SURVEY @ 497' 1 1/4"
455	13 MIN BCS 0000 4796	455-460 GRAVEL-SAND MIX AS ABOVE, PALE RED (10R 6/2)			likely boulder bed @ 455'
460	13 MIN BCS 0000 4797	460-465 GRAVEL-SAND MIX AS ABOVE, PALE RED (10R 6/2) > 60% SAND			
465	10 MIN BCS 0000 4798	465-470 GRAVEL-SAND MIX PALE RED (10R 6/2) > 60% GRAVEL, 5% WHITE FRAGMENTS (N9), 5% LIGHT RED (SR 5/6) REMAINDER GRAYS.			ROUGH DRILLING, BOULDER?
470	9 MIN BCS 0000 4799	470-475 GRAVEL-SAND MIX AS ABOVE PALE RED (10R 6/2)			LOCAL ROUGH DRILLING
475	7 MIN BCS 0000 4800	475-480 GRAVEL-SAND MIX AS ABOVE			475-477 SLOW DRILLING 10 MIN 478' BOULDERS, ROUGH DRILLING GOOD SAMPLE RETURN
480	20 MIN BCS 0000 4801	480-485 GRAVEL-SAND MIX AS ABOVE RETURN WATER WARMER TO TOUCH			ROUGH DRILLING WATER WARMER TO TOUCH
485	7 MIN BCS 0000 4802	485-490 GRAVEL, SILT & CLAY, GRAYISH ORANGE (10YR 7/4) VOLCANIC FRAGMENTS - MIXED LITHOLOGY, BALLS OF SILT & CLAY IN RETURN			MINIMAL SAMPLE RETURN 1 BUCKET ONLY
490	5 MIN BCS 0000 4803	490-495 GRAVEL-SAND AS TO 480-485			
495	8 MIN BCS 0000 4804	495-500 GRAVEL-SAND, PALE RED (SR 6/2) MOSTLY GRAVEL 75% MIXED VOLCANIC LITHOLOGY, MULTICOLORED, MOSTLY GRAYS, BROWNISH GRAYS, 2-3% WHITE (N9), 3-4% REDISH FRAGMENTS			ROUGH DRILLING WATER FLOW DOUBLED DRILLER NOT INJECTING MUCH WATER STOPPED DRILLING AT 517' DEVIATION SURVEY AT 497' 1 1/4"
500	15 MIN BCS 0000 4805	500-505 GRAVEL-SAND AS ABOVE			
505	7 MIN				

Prepared By BENT AAGUST Date 3-30-00 Checked By Bob L. W. Date 4/3/00

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NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

CONTINUATION

Borehole ID NC-EWDP-19D Drill Depth From 505 To 570 Page 4 of 18

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	LITHOLOGIC UNIT	Notes
505	BGS 0000 4800	505-510 GRAVEL-SAND MIX, PALE RED (10R 6/2) MIXED LITHOLOGY AS ABOVE, 450% SAND			RETURN WATER VOLUME REMAINS CONSTANT, WATER IS CLEAR & WARM TO TOUCH
510	5 MIN BGS 0000 4807	510-515 GRAVEL-SAND MIX AS ABOVE			
515	5 MIN BGS 0000 4808	515-520 GRAVEL-SAND MIX, PALE RED (5R 6/2) 250% GRAVEL, MIXED VOLCANIC LITHOLOGY AS ABOVE			
520	5 MIN BGS 0000 4809	520-525 GRAVEL-SAND MIX, PALE RED (10R 6/2) AS ABOVE			Injection water is decreased to 2 gal/min.
525	5 MIN BGS 0000 4810	525-530 GRAVEL-SAND MIX, PALE RED (10R 6/2) AS ABOVE			
530	4 MIN BGS 0000 4811	530-535 GRAVEL-SAND MIX, PALE RED (10R 6/2) AS ABOVE			
535	5 MIN BGS 0000 4812	535-540 GRAVEL-SAND MIX, PALE RED (10R 6/2) AS ABOVE			HOLE CAVING AT END OF ROD AT 537'
540	5 MIN BGS 0000 4813	540-545 GRAVEL-SAND MIX, PALE BROWN (5YR 5/2) AS ABOVE			
545	9 MIN BGS 0000 4814	NO SAMPLE, SAMPLE INTERVAL MISSED WHEN DRILLER HELPER INSTRUCTED TO REPOSITION A TUB UNDER SAMPLE BUCKET.			NO SAMPLE
550	BGS 0000 4815	550-555 GRAVEL-SAND MIX, PALE BROWN (5YR 5/2) AS ABOVE			
555	5 MIN BGS 0000 4816	555-560 GRAVEL-SAND MIX, PALE RED (10R 6/2) AS ABOVE			Splitter cut down to 3/16 split due to increase in water production
560	5 MIN BGS 0000 4817	560-565 GRAVEL-SAND MIX, PALE RED (10R 6/2) AS ABOVE			
565	6 MIN BGS 0000 4818	565-570 GRAVEL-SAND MIX, PALE RED (10R 6/2) AS ABOVE			Sample splitter cut down to 1/8 split.
570	5 MIN				

Prepared By BENT AARQUIST Date 03-30-00 Checked By Bent Aarquist Date 4/3/00

CONTINUATION

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NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

CONTINUATION

Borehole ID NC-EWDP-19D Drill Depth From 635 To 700 Page 6 of 18

DEPTH (Feet)	Top/Bottom of Cuttings Interval	Description of Lithology - Petrology	GRAPHIC LOG	LITHOLOGIC UNIT	Notes
					1200 3-30-00
635	BCS 0000 4832 7 MIN	635-640 Gravel-sand mixture; Pale Red (10R 6/2) Mixed volcanic lithology as above, multi colored, mostly gray, moderate orange pink, pale red			High drill rate, approximately 15+ min
640	BCS 0000 4833 8 MIN	640-645 Gravel-sand mixture, as above. All size fractions from fine sand to fine gravel.			
645	BCS 0000 4834 8 MIN	645-650 Gravel-sand mixture; Mixed volcanic lithology as above. Fragments are angular and drilling induced.			645-650, Poor returns.
650	BCS 0000 4835 8 MIN	650-655 Gravel-sand mixture as above. Lithology represents a homogeneous unit with heterogeneous volcanic clasts. Composition is typical of volcanic derived conglomerate. Most clasts are drilling induced angular, but some rounding is preserved.			No HCL reaction
655	BCS 0000 4836 8 MIN	655-660 as above			Air lifted water at 657' for UNLV-HRC, Irene Farnham - 2x102.
660	BCS 0000 4837 8 MIN	660-665 Gravel-sand mixture as above. No organics, no odor, minor oxidation staining on some clasts. Clasts are glassy and crystal rich. Angular drilling induced fragments and rounded.			650-655 LAST SAMPLE TAKEN before new bit is put on
665	BCS 0000 4838 7 MIN	665-670 Gravel-sand mixture as above. Mixed volcanic clasts. Grayish orange pink (10R 8/2), moderate orange pink (10R 7/4), moderate greenish-yellow (10Y 7/4) medium gray (N5)			From 1250 to 1630 hrs RG is down. Trip out and put new bit on and add intercharge sub 665-745 - 3/16 sample split
670	BCS 0000 4839 14 MIN	670-675 Gravel-sand mixture. A few pumice-rich fragments have deeply weathered pumice. Oxidation is bright red. Moderate increase in fines (2-5%)			660-675 LARGER clast size (1"). Possible function of new BHA.
675	BCS 0000 4840 8 MIN	675-680 Gravel-sand mixture as above. Textural composition ranges from: 55% Sand (fine to med) to 45% gravel (0.99-0.75"). Little to no fines			680 - LARGER clasts persist
680	BCS 0000 4841 20 MIN	680-685 Gravel-sand mixture with fines. Same lithologic composition as above, with 5-10% silt.			material discharged into pit exhibits same textural properties as samples.
685	BCS 0000 4842 7 MIN	685-690 Gravel-sand mixture with fines, as above.			
690	BCS 0000 4843 11 MIN	690-695 Gravel-sand mixture as above. Fine sand fraction diminishing. Material is very clean - no fines, well graded gravel			Returns are becoming very clean - no silt or clay and well-graded gravels
695	BCS 0000 4844 23 MIN	695-700 Gravel-sand mixture as above. Very clean with no fine. Overall color is grayish-red (10R 4/2). Same mixed volcanic clasts as above ranging in color from white (N9), moderate orange pink (10R 7/4), medium gray (N5), dusky red (10R 2/2)			@ 698' - 3 3/4" inclination.

Prepared By BORIS WILCOX Date 3-30-00 Checked By ARTHUR J. MENDENHALL Date 04-12-00

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

CONTINUATION

Borehole ID NC-EW/DP-19D Drill Depth From 700 To 765 Page 7 of 18

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	LITHOLOGIC UNIT	Notes
700	BCS 0000 4845	700-705 Gravel-sand mixture; grayish-red (10R 4/2) to moderate brown (5YR 4/2); Mixed volcanic lithology as above; very clean sand and gravel with little to no fines; no organics. Drill rate ~ 0.4 ft/min			No HCl reaction
705	12 MIN BCS 0000 4846	705-710 Gravel-sand mixture, as above. Gravel: Sand ratio is approximately 1:1. Sand is subangular to subrounded, Gravel is angular to subrounded. Angularity of gravel clasts appears to be drilling induced. Drill rate ~ 0.36 ft/min			Return water becoming cleaner.
710	14 MIN BCS 0000 4847	710-715 Gravel-sand mixture, as above. 35% gravel size clasts to 65% sand size. Sand is well graded (F-M-C). Largest gravel clasts are 3/4". See Notes in log margin.			As noted above, gravel sizes probably result from mill-tooth bit grinding action and not an in situ formation textural property. Formation likely contains pebble and boulder size material.
715	14 MIN BCS 0000 4848	715-720 Gravel-sand mixture, as above. Sand fraction increases slightly. Same mixed volcanic lithology as above with possible increased heterogeneity of coarser fraction			Water production is ~ 52 gpm.
720	BCS 0000 4849	720-725 Gravel-sand mixture, as above. No organics, No odor, No staining. Drill rate is steady at approximately 0.5 ft/min			Return water very clean. Light tan, slightly milky with good clarity.
725	11 MIN BCS 0000 4850	725-730 Gravel-sand mixture as above. Sand shows diminishing fine fraction. No silt or clay present; no organics, No odor, No staining			No HCl reaction
730	12 MIN BCS 0000 4851	730-735 Gravel-sand mixture as above. Increase percentage of greenish-yellow clasts. Sand is predominantly medium to coarse grained, with few fine grained sands. Little or no fines.			
735	17 MIN BCS 0000 4852	735-740 Gravel-sand mixture as above. Picking up fine sand again, possibly minor silt. Mixed volcanic lithology as above. Steady drill rate ~ 0.4 ft/min			Return water in pit showing more fines @ 738' - 4° inclination
740	12 MIN BCS 0000 4853	740-745 Gravel-sand mixture as above; Very clean. 65% well graded sand (F-M-C), 35% gravel size fraction. Little or no fines. Minor oxide staining on few clasts.			No HCl reaction.
745	56 MIN BCS 0000 4854	745-750 Gravel-sand mixture as above; same mixed volcanic clasts as above. Clast color ranges from white (N9), moderate orange-pink (10R 7/4), medium gray (N5), dusky red (10R 2/2)			Good returns; 1/8 sample split.
750	11 MIN BCS 0000 4855	750-755 Gravel-sand mixture as above; Over all color is grayish-red (10R 4/2); Sand is still well graded, subangular to subrounded, Gravel is angular to subrounded			Sample feels warm to touch
755	17 MIN BCS 0000 4856	755-760 Gravel-sand mixture, as above. Minor silt present (1-2%). No organics, No odor, no staining except for minor oxide alteration on few clasts.			No HCl reaction. Sample is warm to touch. DEVIATION SURVEY @ 757' 3-31-00/0050 OFF 4°.
760	21 MIN BCS 0000 4857	760-765 Gravel-sand mixture, as above. Same mixed volcanics with coarsest clasts ≤ 1/2". No organics, No odor, No staining. Absence of fines.			Slight increase in drill rate to ~ 0.8 ft/min
765	8 MIN				

Prepared By BOR WILCOX Date 3-30-00 Checked By ARTHUR J. MENDENHALL Date 04-12-00

REV.

CONTINUATION

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NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

CONTINUATION

Borehole ID DN-C-EWDP-19D Drill Depth From 830 To 895 Page 9 of 18

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	LITHOLOGIC UNIT	Notes
830	BCS 0000 4871	830-835 ASH FLOW TUFF, GRAYISH YELLOW (5Y 7/4), MASSIVE WITH FINE SUGARY TEXTURE BECAUSE OF FINE QUARTZ? PHENOCRYSTS, MINOR, <10% CONTAMINATION FROM ABOVE	+ + + +		
835	11 MIN	835-840 AS ABOVE WITH 20% MODERATE BROWN (5YR 3/4) FRAGMENTS OF DENSELY WELDED TUFF WITH 5% QTZ PHENOCRYSTS	+ + + +		
840	BCS 0000 4872	840-845 AS ABOVE, 10% FRAGMENTS ARE MOD. RED (5R 5/6) ALSO HAVE FELDSPAR PHENOCRYSTS	+ + + +		
845	11 MIN	845-850 AS ABOVE, 10-20% PALE BROWN FRAGMENTS (5YR 5/6)	+ + + +		
850	BCS 0000 4874	850-855 AS ABOVE IS 10% LITHIC FRAGMENTS OF MIXED LITHOLOGY	+ + + +		
855	11 MIN	855-860 AS ABOVE	+ + + +		
860	BCS 0000 4876	860-865 AS ABOVE	+ + + +		
865	13 MIN	865-870 AS ABOVE	+ + + +		
870	BCS 0000 4878	870-875 AS ABOVE	+ + + +		
875	12 MIN	875-880 AS ABOVE BUT 20% LITHICS	+ + + +		
880	BCS 0000 4880	880-885 AS ABOVE	+ + + +		
885	20 MIN	885-890 AS ABOVE	+ + + +		
890	BCS 0000 4882	890-895 AS ABOVE	+ + + +		
895	17 MIN		+ + + +		

WATER IS WARM, BATH TUB TEMP

@ 837' - 4.75" inclination

Prepared By BENT ANQUIST Date 03-31-00 Checked By EL W Date 4/3/00

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

CONTINUATION

Borehole ID DNC-EWDP-19D Drill Depth From 895 To 960 Page 10 of 18

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	LITHOLOGIC UNIT	Notes
895	BCS 0000 4884	895-900 AS ABOVE, 15% LITHICS	+ + + + + + + + + + + +		@898' - 5.0° inclination
900	10 MIN		+ + + +		
	BCS 0000 4885	900-905 AS ABOVE 20% LITHICS	+ + + + + + + + + + + +		
905	12 MIN		+ + + +		
	BCS 0000 4886	905-910 AS ABOVE, 15% LITHICS	+ + + + + + + + + + + +		
910	12 MIN		+ + + +		
	BCS 0000 4887	910-911 AS ABOVE 911-915 GRAVEL SAND MIX, PALE YELLOWISH BROWN (10YR 6/2) HETEROGENEOUS MIX OF VOLCANIC LITHOLOGIES, BETTER WATER CLEAR - NO SILT OR CLAY	0.0.0.0.0. 0.0.0.0.0. 0.0.0.0.0. 0.0.0.0.0. 0.0.0.0.0. 0.0.0.0.0. 0.0.0.0.0. 0.0.0.0.0. 0.0.0.0.0. 0.0.0.0.0.		PENETRATION RATE SLOWED
915	48 MIN				
	BCS 0000 4888	915-920 GRAVEL SAND MIX, TIRRE COLOR NOT POSSIBLE BECAUSE OF CONTAMINATION AT ROD CHANGE, 10% FINE SAND & SILT	0.0.0.0.0. 0.0.0.0.0. 0.0.0.0.0. 0.0.0.0.0. 0.0.0.0.0. 0.0.0.0.0. 0.0.0.0.0. 0.0.0.0.0. 0.0.0.0.0. 0.0.0.0.0.		FLOW TEST 52.5 GAL/MIN AT 250 P.S.I
920					
	BCS 0000 4889	920-921 GRAVEL SAND MIX AS ABOVE 921-925 ASH FLOW TUFF AS TO 905-910 GRAYISH RED (10YR 4/2) & LIGHT RED (5YR 6/6) LITHICS ~10%	+ + + + + + + + + + + +		
925	13 MIN		+ + + +		
	BCS 0000 4890	925-930 AS ABOVE BUT WITH 2% WHITE (N9) CLASTS	+ + + + + + + + + + + +		
930	11 MIN		+ + + +		
	BCS 0000 4891	930-935 AS ABOVE, THE WHITE CLASTS ABOVE ARE A PHASE WITHIN THE TUFF LOCALLY MAKING UP 10% OF UNIT	+ + + + + + + + + + + +		
935	9 MIN		+ + + +		
	BCS 0000 4892	935-940 Lithic ashflow tuff; pumice rich with predominantly 2 types of lithics: 10% grayish-red densely welded fragments and moderate orange-pink (10YR 7/4) fragments. Groundmass is grayish-yellow (5YR 7/4) and phenocryst rich sandstone, calcareous, and micaceous.	+ + + + + + + + + + + +		Relatively constant drill rate ~ 0.4 ft/min. VERY MINOR pipe joint residue in return.
940	24 MIN		+ + + +		
	BCS 0000 4893	940-945 Lithic ashflow tuff, as above with fine sandy texture. Volcanic lithology remains the same.	+ + + + + + + + + + + +		
945	12 MIN		+ + + +		
	BCS 0000 4894	945-950 Lithic ashflow tuff, as above. Fine sandy texture, pre-washed. Groundmass moderate greenish yellow (10YR 7/4) and silt.	+ + + + + + + + + + + +		
950	14 MIN		+ + + +		
	BCS 0000 4895	950-955 Lithic ashflow tuff as above. Percentage and size of lithics as follows: gray-red densely welded (10YR 7/4), moderate orange-pink (2YR 7/4), medium gray (N5) (2.25-1/4"). Groundmass (80% - 1/2"). See note.	+ + + + + + + + + + + +		Note: sizes given for textural components are maximum dimensions.
955	21 MIN		+ + + +		
	BCS 0000 4896	955-960 Lithic ashflow tuff as above	+ + + + + + + + + + + +		@957' - 4.75° inclination
960	26 MIN		+ + + +		

Prepared By BENT August Date 3-3-00 Checked By ARTHUR J. MERRILL Date 04-12-00
BOB WILKINSON

REV.

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

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Borehole ID NC-EWDP-19D Drill Depth From 960 To 1025 Page 11 of 18

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	LITHOLOGIC UNIT	Notes
965	BCS 0000 4897 16 MIN	Lithic ashflow tuff, as above. Moderate yellow green (50% 7/4) groundmass w/ grayish-red, orange pink, medium gray lithics as above. Material is fresh, unweathered, soft.	+ + + + + + + + + + + +		Good returns. Same color as pumice (green-yellow). Poor clarity.
970	BCS 0000 4898 12 MIN	Lithic ashflow tuff, as above. Reduced lithic percentage (2-10%) and reduced maximum size (1/4"). Material is soft and drills easy (0.4 ft/min).	+ + + + + + + + + + + +		No HCl reaction UNLU/LANE "grab" water samples from sample stream
975	BCS 0000 4899 13 MIN	Lithic ashflow tuff, as above. Further reduction in lithic percentage (2-5%); 90-95% pumice. Some lithic and groundmass composition since 950 ft. Predominant lithic is the grayish-red densely welded fraction with progressively diminishing size (from 3/4 to 1/4" over 40 ft interval).	+ + + + + + + + + + + +		Ashflow is producing (52.5 gals/min) Unit is soft and probably few open fractures
980	BCS 0000 4900 26 MIN	975-980 Lithic ashflow tuff as above. No indication is present that material has been reworked; Material is fresh and unweathered; phenocryst in groundmass are predominantly felsic with minor mafic content; predominant lithic constituent is densely welded. Lithics 2-10% angular to subrounded, largest diameter is 3/4" in this interval. Groundmass 90-95% alteration.	+ + + + + + + + + + + +		Largest diameter of constituents is measured parallel to long axis
985	BCS 0000 4901 11 MIN	980-985 Lithic ashflow tuff, as above. No vapor phase alteration is present. Groundmass constitutes 90% of material and contains 1-2% phenocryst content, with predominantly felsic mineralogy. Lithics compose 10% of material with lithology as above. Largest diameter of lithics ~ 3/4".	+ + + + + + + + + + + +		@ 978', UNLU/LANE "grab" water samples from sample stream.
990	BCS 0000 4902 11 MIN	985-990 Lithic ashflow tuff as above. Material is soft, drills easy (0.5 ft/min), unweathered, no alteration, no vapor phase. Very fresh. Groundmass predominantly vitric.	+ + + + + + + + + + + +		No HCl reaction
995	BCS 0000 4903 11 MIN	990-995 Lithic ashflow tuff as above. Lithic content has diminished from 20% to approximately 5% since 960 ft.	+ + + + + + + + + + + +		
1000	BCS 0000 4904 10 MIN	995-1000 Lithic ashflow tuff as above. Soft. Drill rate 0.5 ft/min.	+ + + + + + + + + + + +		Drill rate ~ .5 ft/min.
1005	BCS 0000 4905 10 MIN	1000-1005 Lithic ashflow tuff as above with increasing lithic content (25-30%). Possible lithic surge. Probably a fine layer of lithics mixed by drilling bit.	+ + + + + + + + + + + +		
1010	BCS 0000 4906 9 MIN	1005-1010 Lithic ashflow tuff as above. Lithic poor (1%) lithic constituent's only about 1/8" in diameter. Ash groundmass constitutes approx. 99% of material. Largest diameter of groundmass fragments = 1/2-3/4"	+ + + + + + + + + + + +		
1015	BCS 0000 4907 10 MIN	1010-1015 Lithic ashflow tuff as above. Lithic poor. Volcanic lithology the same as above: 90-95% Moderate yellow green groundmass slightly vitric, fresh. Approximately 5% lithics: grayish-red, orange pink, medium gray.	+ + + + + + + + + + + +		
1020	BCS 0000 4908 10 MIN	1015-1020 Lithic ashflow tuff as above. Based on layering present in tub, it appears that lithics may occur in thin lenses and mixing is occurring during drilling.	+ + + + + + + + + + + +		
1025	BCS 0000 4909 15 MIN	1020-1025 Lithic ashflow, as above. Lithic rich (25%). Contaminated with up hole material during red change.	+ + + + + + + + + + + +		
1030	10 MIN		+ + + + + + + + + + + +		

Prepared By Bob (Nikova) Date 3-31-00 Checked By ARTHUR J. McNEILL Date 04-12-00

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

CONTINUATION

Borehole ID NC-EWDF-19D Drill Depth From 1025 To 1090 Page 12 of 18

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	LITHOLOGIC UNIT	Notes
1030	BCS 0000 4910 10 MIN	1025-1030 Lithic ashflow tuff, as above. Ash ground mass is moderate greenish-yellow (10Y 7/4) fresh, no reworking. Slightly vitric, predominantly devitrified. 30% lithic content + predominantly grayish-red (5R 4/2), densely welded fragments.	+ + + + + + + + + + + +		Drills fast and easy (0.5 ft/min)
1035	BCS 0000 4911 10 MIN	1030-1035 Lithic ashflow tuff, as above. Lithic poor (1-2%), composed of grayish-red (5R 4/2), moderate orange pink (10R 7/4), medium gray (N5), largest diameter 1/16". Angular to subangular. Phenocryst poor (1%), 100% felsic, trace mafic.	+ + + + + + + + + + + +		No HCl reaction Lithic rich sections probably result from mixing of lithic lenses within unit.
1040	BCS 0000 4912 8 MIN	1035-1040 Lithic ashflow tuff, as above. moderate greenish-yellow ash ground mass (75%), ground mass contains 1 to 2% brownish-yellow vitric pumice displaying little to no flattening and therefore nonwelded. No vapor phase mineralization.	+ + + + + + + + + + + +		Good returns.
1045	BCS 0000 4913 10 MIN	1040-1045 Lithic ashflow tuff, as above. Lithic rich (25%) same as above.	+ + + + + + + + + + + +		No HCl reaction
1050	BCS 0000 4914 10 MIN	1045-1050 Lithic ashflow tuff, as above. Lithic poor (1-2%) same volcanic lithology.	+ + + + + + + + + + + +		Drill rate staying steady throughout ashfall unit averaging 0.5 ft/min
1055	BCS 0000 4915 8 MIN	1050-1055 Lithic ashflow tuff, as above. Drill fast and easy (~0.5 ft/min). Maximum size of ground mass fragments 3/4"; maximum size of lithic constituents 1/2".	+ + + + + + + + + + + +		Good returns.
1060	BCS 0000 4916 10 MIN	1055-1060 Lithic ashflow tuff, as above. Ash ground mass ~95%, largest fragment 1/2"; lithic content 5% with largest diameter 1/8"; angular to subangular.	+ + + + + + + + + + + +		Very homogeneous ashfall unit with thin lithic lenses.
1065	BCS 0000 4917 9 MIN	1060-1065 Lithic ashflow tuff, as above. Lithic rich (25%) same mixed volcanic lithology since ~935 ft. Rock is fresh, no alteration present except devitrified ground mass.	+ + + + + + + + + + + +		
1070	BCS 0000 4918 10 MIN	1065-1070 Lithic ashflow tuff, as above.	+ + + + + + + + + + + +		No HCl reaction
1075	BCS 0000 4919 10 MIN	1070-1075 Lithic ashflow tuff, as above. Lithic poor (2%), predominantly grayish-red lithics (5R 4/2), largest diameter 1/8". Ground mass fragments 1/2" in diameter parallel to long axis.	+ + + + + + + + + + + +		Sample is warm to touch
1080	BCS 0000 4920 10 MIN	1075-1080 Lithic ashflow tuff, as above. Lithic rich (25-40%). Largest diameter of fragments 1/2".	+ + + + + + + + + + + +		
1085	BCS 0000 4921 9 MIN	1080-1085 Lithic ashflow tuff, as above.	+ + + + + + + + + + + +		SAMPLE IS WARM
1090	BCS 0000 4922 9 MIN	1085-1090 Lithic ashflow tuff, as above. Very uniform since 935 ft.	+ + + + + + + + + + + +		SAMPLE IS WARM

Prepared By BOB WILSON Date 3-31-00 Checked By ARTHUR J. MENDENHALL Date 04-12-00

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

CONTINUATION

Borehole ID NC-EWDP-19D Drill Depth From 1090 To 1155 Page 13 of 18

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	LITHOLOGIC UNIT	Notes
1095	BCS 0000 4923 10 MIN	1090-1095 Lithic ashflow tuff, as above. Ash ground mass is moderate greenish-yellow (10Y7/4); fresh, no signs of reworking or weathering; predominantly devitrified. 30% lithic content. Lithics - predominantly grayish red (5Y4/2) with lesser mod. orange-pink (6YR 7/4) and medium gray (N5).	+ + + + + + + + + + + +		Drills fast and easy. Drill rate relatively constant through ash flow unit ~ 0.5 ft/min
	BCS 0000 4924	1095-1100 Lithic ashflow tuff, as above. Ground mass contains 1-2% greenish-yellow vitric pumice displaying no flattening; no vapor phase mineralization present. Lithics are angular to subrounded.	+ + + + + + + + + + + +		Airlift water volume using timed bucket method 52.5 gals/min
1100	BCS 0000 4925 10 MIN	1100-1105 Lithic ashflow tuff, as above. Lithic content 25-30%, largest diameter 3/4"; largest fragment of ash ground mass 3/4". Unit is homogeneous unit and probably contains thin beds of lithics based on layering in sample tubs.	+ + + + + + + + + + + +		No HCl reaction
1105	BCS 0000 4926 9 MIN	1105-1110 Lithic ashflow tuff, as above. no noticeable variability.	+ + + + + + + + + + + +		SAMPLE IS WARM
1110	BCS 0000 4927 9 MIN	1110-1115 Lithic ashflow tuff, as above.	+ + + + + + + + + + + +		
1115	BCS 0000 4928 11 MIN	1115-1120 Lithic ashflow tuff, as above. Lithic composition is bimodal in this interval: grayish-red and moderate orange-pink. Lithics constitute 35-40% of material. Largest diameter ~ 3/4"	+ + + + + + + + + + + +		Good returns
1120	BCS 0000 4929 14 MIN	1120-1125 Lithic ashflow tuff, as above.	+ + + + + + + + + + + +		
1125	BCS 0000 4930 10 MIN	1125-1130 Lithic ashflow tuff, as above. Ground mass is predominantly devitrified but some vitric texture is present. Ground mass contains few pumice (1%) and pumice is slightly darker green.	+ + + + + + + + + + + +		Drill rate ~ 0.5 ft/min
1130	BCS 0000 4931 10 MIN	1130-1135 Lithic ashflow tuff, as above.	+ + + + + + + + + + + +		
1135	BCS 0000 4932 10 MIN	1135-1140 Lithic ashflow tuff as above.	+ + + + + + + + + + + +		
1140	BCS 0000 4933 10 MIN	1140-1145 AS ABOVE	+ + + + + + + + + + + +		Booster compressor added; ~400 psi
1145	BCS 0000 4934 10 MIN	1145-1150 AS ABOVE	+ + + + + + + + + + + +		
1150	BCS 0000 4935 10 MIN	1150-1155 AS ABOVE	+ + + + + + + + + + + +		
1155	10 MIN		+ + + + + + + + + + + +		

Prepared By BOB WILCOX Date 3/31/00 Checked By ANTHONY J. MERRIFIELD Date 04-12-00

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

CONTINUATION

Borehole ID NC-EWDP-19D Drill Depth From 1155 To 1220 Page 14 of 18

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	LITHOLOGIC UNIT	Notes
1155	BCS 0000 4936	1155-1160 ASH FLOW AS ABOVE, 10% LITHICS	+ + +		
1160	13 MIN		+ + +		
1165	BCS 0000 4937	1160-1165 ASH FLOW AS ABOVE	+ + +		
1165	15 MIN		+ + +		
1170	BCS 0000 4938	1165-1170 ASH FLOW AS ABOVE	+ + +		
1170	10 MIN		+ + +		
1175	BCS 0000 4939	1170-1175 ASH FLOW AS ABOVE, 15% LITHICS	+ + +		
1175	9 MIN		+ + +		
1180	BCS 0000 4940	1175-1180 ASH FLOW AS ABOVE, 10% LITHICS	+ + +		
1180	11 MIN		+ + +		
1185	BCS 0000 4941	1180-1185 AS ABOVE, 18% LITHICS	+ + +		
1185	9 MIN		+ + +		
1190	BCS 0000 4942	1185-1190 AS ABOVE, 10% LITHICS	+ + +		
1190	11 MIN		+ + +		
1195	BCS 0000 4943	1190-1195 AS ABOVE	+ + +		
1195	11 MIN		+ + +		
1200	BCS 0000 4944	1195-1200 AS ABOVE	+ + +		
1200	11 MIN		+ + +		
1205	BCS 0000 4945	1200-1205 AS ABOVE, 18% LITHICS	+ + +		
1205	11 MIN		+ + +		
1210	BCS 0000 4946	1205-1210 AS ABOVE	+ + +		
1210	11 MIN		+ + +		
1215	BCS 0000 4947	1210-1215 AS ABOVE	+ + +		
1215	11 MIN		+ + +		
1220	BCS 0000 4948	1215-1220 AS ABOVE	+ + +		
1220	11 MIN		+ + +		

FLOW TEST AT 1158' AT
04-01-00/0120HRS. 90 GAL/MIN

DEVIATION SURVEY AT
1198' 4 3/4"

1218' FLOW TEST 2100 GAL/
375 PSI AT 0630HRS

Prepared By BENT ARQUIST Date 04-01-00 Checked By B. L. W. Date 9/3/00

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

CONTINUATION

Borehole ID NC-FWDP-19D Drill Depth From 1220 To 1285 Page 15 of 18

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	LITHOLOGIC UNIT	Notes
1225	BCS 0000 4949 12 MIN	1220-1225 ASH FLOW AS ABOVE	+ + + + + + + + + + + + + + + +		
1230	BCS 0000 5001 11 MIN	1225-1230 AS ABOVE	+ + + + + + + + + + + + + + + +		
1235	BCS 0000 5002 15 MIN	1230-1235 AS ABOVE BUT LOWER PART PALE GREENISH YELLOW (10Y 8/2)	+ + + + + + + + + + + + + + + +		
1240	BCS 0000 5003 18 MIN	1235-1238 AS ABOVE	+ + + + + + + + + + + + + + + +		
1245	BCS 0000 5004 12 MIN	1238-1240 LITHIC RICH PHASE OF ABOVE	+ + + + + + + + + + + + + + + +		
1250	BCS 0000 5005 14 MIN	1240-1245 AS ABOVE BUT PALE ORANGE (10YR 8/4) 18% LITHICS	+ + + + + + + + + + + + + + + +		
1255	BCS 0000 5005 10 MIN	1245-1250 Contact: Ashflow tuff/Interbedded sand with gravel and finely laminated claystone and siltstone. Interbedded sequences are aggraded (coarsening downward and stacked). Claystone is lt. brownish gray (5YR 6/1) to lt. olive gray (5Y 6/1) and has 4-10mm laminations, unit is mixed with sandy gravel beds.			Contact ~ 1245
1260	BCS 0000 4951 17 MIN	1250-1255 as above. Further description as follows: Sandy gravel beds are pale red (10R 6/2) showing well rounded sand grains with subround to subangular gravels. Lithology is mixed volcanic.			
1265	BCS 0000 4952 28 MIN	1255-1260 as above			
1270	BCS 0000 4953 10 MIN	1260-1265 SAND WITH MINOR GRAVEL, PALE RED (10R 6/2) 20% SILT & FINE SAND, 15% SAND GRAINS LIGHT RED (5R 6/6) LOCAL MINOR GRAVEL. Interbedded as above			BROWN WATER
1275	BCS 0000 4954 7 MIN	1265-1270 SILT TO COARSE SANDS, PALE RED (10R 6/2) <20% GRAVEL. Interbedded as above			
1280	BCS 0000 4955 19 MIN	1270-1275 AS ABOVE, <5% GRAVEL			
1285	BCS 0000 4956 17 MIN	1275-1280 SAND GRADING INTO GRAVEL WITH CLAY IN LAST FOOT GRAVEL CONSISTS OF RED & WHITE CLASTS. SAND AS ABOVE			
	BCS 0000 4957	1280-1285 GRAVEL SAND MIX, PALE RED (10R 6/2) HETEROGENEOUS VOLCANIC LITHOLOGY. AS ABOVE			

Prepared By BENT AAQUIST/ Bob Wilcox Date 04-01-00 Checked By ARTHUR J. McNEAMIN Date 04-12-00

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

CONTINUATION

Borehole ID NC-EWDP-19D Drill Depth From 1285 To 1350 Page 16 of 18

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	LITHOLOGIC UNIT	Notes
1290	BCS 0000 4958 17 MIN	1285-1290 Silty gravelly sand with minor clay; Moderate yellowish-brown (10YR 5/4); 84% well graded sand (fine) 16% fine gravel, angular to subangular; mixed volcanic lithology; 5% silt; 1% clay; interbedded as above			Material can be moulded in palm indicating clay
1295	BCS 0000 4959 10 MIN	1290-1295 Silty gravelly sand with clay as above gravel lithology: greenish-red (10YR 4/2), nodular; moderate orange-pink (10YR 7/4), weathering orange-red; medium gray (N5); light greenish gray (5GY 8/1) Interbedded as above			BW 4-1-00 Possible contamination from up-hole drill string raised > 5' for clean cut crossed out above Note because no contamination was evident upon sampling
1300	BCS 0000 4961 70 MW	1295-1300 well graded sand; moderate yellowish brown (10YR 5/4); fine to medium coarse, well rounded grains; mixed volcanic lithology; minor silt (1%) ; very clean interbedded as above. Fewer gravel			Aggraded (coarsening down) stacked sequences
1305	BCS 0000 4962 60 MIN	1300-1305 Gravelly sand; moderate yellowish brown (10YR 5/4) 85% Medium to coarse sand, well rounded; 25% fine gravel, 3/4" largest diameter but predominantly 1/4-1/2" subangular to subrounded; very clean material - no fines			
1310	BCS 0000 4963 25 MW	1305-1310 Gravelly sand interbed as above			
1315	BCS 0000 4964 15 MW	1310-1315 well graded sand with gravel interbed, as above			Whole tub sample collected No HCL reaction
1320	BCS 0000 4965 20 MW	1315-1320 well graded sand with siltstone lenses; dark yellowish brown (10YR 6/6) to moderate yellowish brown (10YR 6/3); 90% fine-med-coarse sand; contains drilling mud fragments of dark yellowish orange (10YR 6/4) well indurated siltstone & trace fine gravel. Interbedded as above			Minor pipe joint compound in return water
1325	BCS 0000 4966 60 MW	1320-1325 well graded gravelly sand with minor silt; 85% sand/fine-med-coarse grained; 14% fine to coarse gravel (1/4-3/4") with trace fine cobbles (1"); 1% siltstone fragments Interbedded as above			No HCL REACTION
1330	BCS 0000 4967 15 MW	1325-1330 well graded gravelly sand with siltstone lenses as above. Siltstone fragments show prominent bedding accentuated by reddish orange weathered horizons; trace of soft clay; 90% SAND; 10% fine gravel (1/4-3/4") Interbedded as above			
1335	BCS 0000 4968 15 MW	1330-1335 well graded silty gravelly sand with fragments of moderate to well indurated siltstone and sandstone. Very minor clay (1%). Interbedded as above			Timed bucket test ~100 gals/min
1340	BCS 0000 4969 15 MIN	1335-1340 well graded gravelly sand with siltstone lenses; predominantly medium to coarse sand with 10% fine gravel. 15% fragments of well indurated silt and sandstone. Interbedded as above			Very clean return water
1345	BCS 0000 4970 65 MW	1340-1345 clayey silty gravelly sand; as above with silt and clay balls in sample. 85% fine gravel, 85% sand; 5% silt, 5% clay. Interbedded as above			Clay balls
1350	BCS 0000 4970 20 MIN	1345-1350 silty sand with minor gravel; light brown (5YR 5/6); predominantly fine to medium sand, 55% fine gravel (1/4"); 5-10% silt. Interbedded as above			

Prepared By BOB WILCOX Date 4-1-00 Checked By ARTHUR J. MENNENHALL Date 04-12-00

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

CONTINUATION

Borehole ID NC-EWDP-19D Drill Depth From 1350 To 1415 Page 17 of 18

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	LITHOLOGIC UNIT	Notes
1355	BCS 0000 4971 23 MIN	1350-1355 - GRAVEL WITH SILT IN UPPER 2 FEET. PALE RED (10R 6/2). Interpretive stratigraphy consists of interbedded sands with gravel, finely laminated siltstone and claystone. Sequences are aggraded, coarsening downward. Sands and gravels are rounded to subrounded as above. Sequence since 1245 ft.			Sequence described has persisted since 1245 ft. WATER BROWN
1360	BCS 0000 4972 7 MIN	1355-1360 SAND WITH LOCAL GRAVEL, PALE YELLOWISH BROWN (10YR 6/2). LOCAL SILTSTONE CHIPS. POSSIBLE INTERBEDDED SEQUENCE. SILTSTONE PALE OLIVE (10Y 6/2)			
1365	BCS 0000 4973 15 MIN	1360-1365 AS ABOVE. Interbedded sands containing fine gravel, finely laminated siltstone and claystone as above			WATER LT. GRAY
1370	BCS 0000 4974 45 MIN	1365-1370 GRAVEL WITH MINOR SAND & SILT. MOST COMMON CLAST COLOR IS GRAYISH RED (5R 4/2). OTHER SHADES OF RED, GRAY AND MINOR WHITE			WATER LT. BROWN WATER LT. GRAY ALMOST 50% AS MUCH SAMPLE MATERIAL IN BUCKETS AS NORMAL FROM 1365-1375
1375	BCS 0000 4975 20 MIN	1370-1375 GRAVEL AS ABOVE. Interbedded sands containing fine gravel, finely laminated silt and claystone as above			
1380	BCS 0000 4976 20 MIN	1375-1380 well graded gravelly sand with minor silt. Pale yellowish brown (10YR 6/2), 60% F.M.C. sand 40% fine gravel (1/4-3/4"), gravel and sand composition as above. Interbedded as above			
1385	BCS 0000 4977 10 MIN	1380-1385 well graded gravelly sand with minor silt as above. Gravel size and percentage reducing. Interbedded sequences as above			No HCl reaction
1390	BCS 0000 4978 10 MIN	1385-1390 well graded gravelly sand with minor silt as above. Gravel percentage and size fining.			Lots of sample, gravelly sands probably loose to medium dense and bore hole walls caving?
1395	BCS 0000 4979 10 MIN	1390-1395 well graded gravelly sand as above 75% F.M.C. sand, 20% fine gravel (1/4"), 5% silt. Gravel size and percentage. Interbedded sequences as above			Less sample produced
1400	BCS 0000 4980 20 MIN	1395-1400 Finely interbedded sands with fine gravel, siltstone, and claystone in aggraded coarsening down sequence, as above since 1245 ft. becoming finer			
1405	BCS 0000 4981 30 MIN	1400-1405 Interbedded as above 65% sand, 15% silt 15% clay, 10% fine gravel (1/4-1/2"). Material is fining with fewer and finer gravels.			
1410	BCS 0000 4982 70 MIN	1405-1410 Interbedded as above with silty sands comprising most of the interval - 85% sand, 10% silt, 5% gravel			
1415	BCS 0000 4983 45 MIN	1410-1415 Interbedded as above			

Prepared By Bob Wilcox / Bert Aquist Date 4-2-00 Checked By Arthur J. Mendenhall Date 04-12-00

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

CONTINUATION

Borehole ID NC-EWDP-19D Drill Depth From 1415 To 1438 Page 18 of 18

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	LITHOLOGIC UNIT	Notes
	BCS 0000 4984	1415-1420 Interbeds as above			
1420	10MIN BCS 0000 4985	1420-1425 Interbedded sequence as above, this interval transitions into coarse unit. Moderate orange-brown (10YR 4/6) presence of bright reddish-orange volcanic clasts (1/4"-1/2") lends reddish color to sample. Clasts are weathered and contain "beer bottle" (amber) glass shards. Also orange-brown weathered ss frags			Pronounced change in color of return water for interval 1420-1425. Instead of the usual mucky tan it changed to bright orange. Color reverts to mucky tan brown at 1425 ft.
1425	10MIN BCS 0000 4986	1425-1430 As above sequence with color change to pale yellowish brown (10YR 6/3). Pronounced reduction of reddish-orange ashflow clasts noted in above interval.			
1430	10MIN BCS 0000 4987	1430-1435 Interbed sequence as above with color (Gray orange 10YR 7/4) becoming less orange than above. Over all color also lightened by tuff clasts (white (N9) to pinkish gray (5YR 8/1)). Reduced grain size. Silt and clay comprise 90% of material.			
1435	10MIN BCS 0000 4988	1435-1438 As above interval (1430-1435)			
1440	5MIN BCS 0000 4989				
1445	BCS 0000 4990				
1450	BCS 0000 4991				
1455	BCS 0000 4992				
1460	BCS 0000 4993				
1465	BCS 0000 4994				
1470	BCS 0000 4995				
1475	BCS 0000 4996				
1480					

T.D. hole @ 1438.32 4260

Prepared By Bob Wilcox Date 4-2-00 Checked By ARTHUR J. MENDEHAM Date 04-12-00