

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

NC-WASHBURN-1X
 Borehole ID _____ Drill Depth From 0.0 To 658.0 FT Page 1 of 11
 Driller EARL MANGUM/NIEL HALE Start Date/Time 12/1/98, 1245 End Date/Time 12/5/98 2030
 Drilling Equip./Method SCHRAMM 685 DHH REVERSE CIRCULATION Sampling Equip./Method Cyclone/Splitter
 Samples collected from collar 0-20'

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	Lithologic Unit	Notes	
5	BCS 00000 251	VALLEY FILL 0.0 - 658.0 SILTY SAND: Pale yel brn (10YR 6/2) dry; Moderate yel brn (10YR 5/4) when wet. Fine sand from 0.0 - 5.0'. Sand coarse below 5.0' < 10% fine subangular volcanic gravels. Some cobbles from 3.0 - 5.0' Occasional boulders below 5.0'. Some cobbles from 17.5 - 20.0'			Samples wet from 0 - 20' due to injected water	
	BCS 00000 252					
10	BCS 00000 253					
15	BCS 00000 254					
20	BCS 00000 255	COBBLES COMMON, WITH SILT & SAND MIXED LITHOLOGY, WELDED TUFFS AND TUFFACEOUS UNITS			B. AAQUIST WELDING SLAG IN SAMPLE WHILE FIXING SAMPLE SPLITTER 1 1/2" SCHED 80 PVC HOLE FILLED WITH AQUAGUARD AT 50' DRILLER STARTED DRILLING WET	
25	BCS 00000 256					
30	BCS 00000 257					
35	BCS 00060 258					
40	BCS 00000 259					
45	BCS 00000 260					
50	BCS 00000 261					
55	BCS 00000 262					

LOGGED BY K. DONNELSON 0-20'

Prepared By BENT AAQUIST Date 12-2-98 Checked By ARTHUR J. MENDOZA Date 1/4/99

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

NC-WASHBURN -1X
 Borehole ID _____ Drill Depth From 60 To 120 Page 2 of 11
 Driller EARL MANGUM Start Date/Time N/A End Date/Time N/A
 Drilling Equip./Method SCHRAMM 685 DHH Sampling Equip./Method CUTTINGS COLLECTED IN BUCKETS

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	Lithologic Unit	Notes
65	BCS 00000 263	VALLEY FILL, sand and gravel MIXED LITHOLOGY - MOSTLY TUFFS AND WELDED TUFFS			
	BCS 00000 264				
70	BCS 00000 265				
75	BCS 00000 266				
80	BCS 00000 267	BASALT FRAGMENTS COMMON BELOW 80'			
85	BCS 00000 268	CALICHE PRESENT ON 5% OF ROCK FRAGMENTS			1 1/2" SCHED 80 PVC HOLE FILLED WITH AQUAGUARD
90	BCS 00000 269				
95	BCS 00000 270				LARGE PEBBLES & COBBLES CLOGGING X-OVER BLOCKING RETURN. DRILLER TRIPPED OUT TO WELD BARS ON X-OVER. WHEN HE GOT TO 100'.
100	BCS 00000 271				
105	BCS 00000 272	BASALT FRAGMENTS COMMON, MINOR FLOW BANDED RHYOLITE MOSTLY TUFF FRAGMENTS			
110	BCS 00000 273				COARSE ANGULAR GRAVEL PLUGGING RETURN AT TIMES
115	BCS 00000 274				
120					

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

Borehole ID NC-WASHBURN-1X Drill Depth From 120 To 180 Page 3 of 11
 Driller EARLMANGUM/NEIL HALE Start Date/Time N/A End Date/Time N/A
 Drilling Equip./Method SCHRAMM 685 DHH Sampling Equip./Method WET / BUCKETS

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	Lithologic Unit	Notes
125	BCS 00000 275	VALLEY FILL, sand and gravel MIXED LITHOLOGY MOSTLY TUFFS			
	BCS 00000 276				
130	BCS 00000 277	COARSE GRAVEL			
135	BCS 00000 278				
140	BCS 00000 279	HOSTLY COARSE SAND/GRIT			
145	BCS 00000 280	COARSE GRAVEL			
150	BCS 00000 281				
155	BCS 00000 282				
160	BCS 00000 283	--- SHIFT CHANGE - NIGHT SHIFT ON (A. MENDENTHAL, logging by Jamie Walker J. WALKER)			
165	BCS 00000 284	coarse gravels, mostly w/ volcanic clasts of reddish rhyolite (10R 4/2).			
170	BCS 00000 285				
175	BCS 00000 286	becoming coarser w/ large pebbles in return,			
180					

1 1/2" SCHED 80 PVC
 HOLE FILLED WITH AQUAGUARD

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

NC- WASHBURN - 1X
 Borehole ID _____ Drill Depth From 180 To 240 Page 4 of 11
 Driller NEIL HALE / EARL MAGNUM Start Date/Time N/A End Date/Time N/A
 Drilling Equip./Method SCHRAMM 685 DDH Sampling Equip./Method WET / BUCKETS

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	Lithologic Unit	Notes
185	BCS 00000 287	Coarse gravels w/ volcanic clasts (as above)			
190	BCS 00000 288				
195	BCS 00000 289	Reddish (10R 4/2) volcanic boulder (~2')			
195	BCS 00000 290	Coarse sand bed - lost return, bit plugging at exchange Plugged bit ~ 196' - tripped out three times (20:30 - 05:00) — end of night shift —			
200	BCS 00000 291	COURSE GRAVEL - ANGULAR TO ROUND, VOLCANIC CLASTS PEBBLE SIZE			12-3-98 DAY SHIFT
205	BCS 00000 292				
210	BCS 00000 293				1 1/2" SCHED 80 PVC HOLE FILLED WITH AQUAGUARD
215	BCS 00000 294				
220	BCS 00000 295	GRAVEL MOSTLY ROUNDED			
225	BCS 00000 296				
230	BCS 00000 297				
235	BCS 00000 298				
240					

Prepared By JAMIE WALKER / BENT Date 12-3-98 Checked By ARTHUR J. MENDENHALL Date 1/4/99
 ARQUIST

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

NC-WASHBURN-1X
 Borehole ID _____ Drill Depth From 240 To 300 Page 5 of 11
 Driller EARL MANGUM Start Date/Time N/A End Date/Time N/A
 Drilling Equip./Method SCHRAMM 68S DHT Sampling Equip./Method WET BUCKETS

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	Lithologic Unit	Notes
245	BCS 00000 299	COARSE GRAVEL, PEBBLES, MOSTLY ROUND, sandy matrix			12 SECTIONS OF 20' LONG 3/4" TREHIE PIPE LOST IN HOLE. BOTTOM OF PIPE AT 295' IN BENTONITE HOLE PLUG
	BCS 00000 300				
250	BCS 00000 301				
255	BCS 00000 302				
260	BCS 00000 303				
265	BCS 00000 304				
270	BCS 00000 305				
275	BCS 00000 306				
280	BCS 00000 307				
285	BCS 00000 308				
290	BCS 00000 309	VERY COARSE SAND			FROM HERE TO SURFACE HOLE FILLED WITH AQUAGUARD 295.2 BENTONITE HOLE PLUG
295	BCS 00000 310				
300					

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

NC-WASHBURN-1X

Borehole ID _____ Drill Depth From 200 To 360 Page 6 of 11

Driller EARL MANIGUM Start Date/Time N/A End Date/Time N/A

Drilling Equip./Method SCHRAMM 685 DHH Sampling Equip./Method WET BUCKETS

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	Lithologic Unit	Notes
305	BCS 00000 311	MOSTLY COARSE SAND			
310	BCS 00000 312				← ZONE FILLED WITH BENTONITE HOLE PLUG
315	BCS 00000 313				310.0 ZONE FILLED WITH 10-20 SAND
320	BCS 00000 314	COARSE PEBBLE WITH MINOR SAND			316.2 ZONE FILLED WITH 30 SAND
325	BCS 00000 315				316.8 SCHED 80 1 1/2" PVC PIPE
330	BCS 00000 316	▽ 327.37' @ 1630, 12-S-98 - WATER LEVEL			← ZONE FILLED WITH 8-12 SAND
335	BCS 00000 317	MIX OF COARSE SAND AND PEBBLES, POSSIBLE BROKEN COBBLES			← ZONE FILLED WITH 8-12 SAND
340	BCS 00000 318				2 0.020" SLOT SCHED 80, 1 1/2" PVC SCREEN 20'
345	BCS 00000 319	COARSE PEBBLES MOSTLY			DRILLING WITH MORE POLYMER MUD TO STABILIZE HOLE
350	BCS 00000 320				
355	BCS 00000 321	FINER PEBBLE GRAVEL			353.0' ← ZONE FILLED WITH CAVE MATERIAL
360	BCS 00000 322				DRILL DOWN FROM 1230 TO 1515 HRS. TRIPPED OUT TO PUT ADAPTOR ON ABOVE X-OVER TO PREVENT SAND FROM PLUGGING PORTS

Prepared By BENT AAQUIST Date 12-3-98 Checked By ARTHUR J. MENDENHALL Date 1/4/99

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

NC - WASHBURN - 1X
 Borehole ID _____ Drill Depth From 360 To 420 Page 7 of 11
 Driller EARL MANGUM / NEIL HALE Start Date/Time N/A End Date/Time N/A
 Drilling Equip./Method SCHRAMM 685 DHA Sampling Equip./Method WET BUCKET

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	Lithologic Unit	Notes
365	BCS 00000 323	VALLEY FILL COARSE PEBBLE GRAVEL			← ZONE FILLED WITH CAVED MATERIAL AFTER GRAVEL WAS ADDED
370	BCS 00000 324				
375	BCS 00000 325	∇ 370.33' @ 1115HRS, 12-10-98 =			
380	BCS 00000 326				374.5' ← ZONE FILLED WITH 10 - 5GALLON BUCKETS OF PEA GRAVEL
385	BCS 00000 327	COARSE SAND TO FINE PEBBLE			
390	BCS 00000 328				384.8' ← 1 1/2" SCHED 80 PVC ← ZONE REQUIRED 7150 POUNDS OF 8-12 SAND AND 34 - 5GALLON BUCKETS OF PEA GRAVEL TO FILL
395	BCS 00000 329	COARSE PEBBLY GRAVEL COARSE SAND			
400	BCS 00000 330	COARSE PEBBLY GRAVEL STARTED BETWEEN 397' AND 398'			395.8' CEMENT SEAL 400'
405	BCS 00000 331	- HOLE MAKING A LITTLE WATER - APPARENT AT 401.5'			8/12 SAND PACK PACK DAY SHIFT STOPPED DRILLING AT 404' 12-3-98
410	BCS 00000 332				
415	BCS 00000 333				
420	BCS 00000 334				

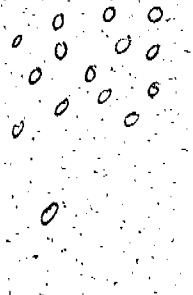
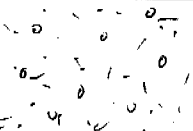


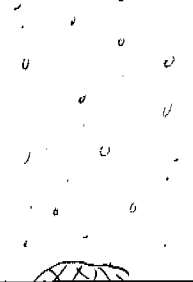
NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

Borehole ID NC-WASHBURN-1X Drill Depth From 420 To 480 Page 8 of 11

Driller EARL MANGUM/NEIL HALE Start Date/Time N/A End Date/Time N/A

Drilling Equip./Method SCHRAMM 685 DIA Sampling Equip./Method MET BUCKET

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	Lithologic Unit	Notes
425	BCS 00000 335	VALLEY FILL, sand and gravel			8/12 SAND PACK
430	BCS 00000 336	COARSE SAND, similar to coarse sand at 193' with similar lost return.			
435	BCS 00000 337	NO CUTTINGS RECOVERED	No SAMPLE		0.020" SLOT SCHED 80 1 1/2" PVC SCREEN
440	BCS 00000 338	NO CUTTINGS RECOVERED			
445	BCS 00000 339	POOR RECOVERY Primarily multicolored gravels.			FROM 0600-1410 12-4-98 SPENT RECONDITIONING HOLE
450	BCS 00000 340	NO CUTTINGS RECOVERED	No SAMPLE		END OF DAY SHIFT START OF NIGHT SHIFT 12-4-98 from 1800-0340 of 12-4-98/12-5-98 changing to new bit type (non-exchange) and re-starting recovery
455	BCS 00000 341	Sandy gravels; various rock fragment types; gen. red-brown colors, very little fine material			
460	BCS 00000 342				
465	BCS 00000 343				
470	BCS 00000 344				
475	BCS 00000 345				
480	BCS 00000 346				

Prepared By BENT ARQUIST/JAMIE WALKER Date 12-5-98 Checked By ARTHUR J. MENDENHALL Date 1-4-99

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

Borehole ID DNC-UMSHBURN-1X Drill Depth From 480 To 540 Page 9 of 11
 Driller NEIL HALE Start Date/Time N/A End Date/Time N/A
 Drilling Equip./Method SARATOGA 685 DHP Sampling Equip./Method WET BUCKET

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	Lithologic Unit	Notes
485	BCS 00000 347	Sandy gravels as above 1' boulder 480-481			1 1/2" PVC BLANK SECTION
490	BCS 00000 348				
495	BCS 00000 349				
500	BCS 00000 350				
505	BCS 00000 351				
510	BCS 00000 352				
515	BCS 00000 353				
520	BCS 00000 354				
525	BCS 00000 355				
530	BCS 00000 356				
535	BCS 00000 357	530-540 Coarser gravels			510'
540	BCS 00000 358				

Prepared By JAMIE WALKER Date 12-4-98 Checked By ATIMA J. MENDENHALL Date 1-4-99
 NIGHT SHIFT

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

Borehole ID NC-WASHBURN-IX Drill Depth From 540 To 600 Page 10 of 11
 Driller NEIL HALE/EARL MANGUM Start Date/Time N/A End Date/Time N/A
 Drilling Equip./Method SCHRAMM 68S DHH Sampling Equip./Method WET BUCKET

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	Lithologic Unit	Notes
	BCS 00000 359	SANDY GRAVELS, AS ABOVE			
545	BCS 00000 360	Clay with fine pebbles and sand, light brown 54R 5/6			
550	BCS 00000 361	Coarse sands and gravels.			
555	BSC 00000 362				
560	BSC 0000 363				END OF NIGHT SHIFT @ 558' DAY 12-5-98
565	BSC 00000 364	SAND, Pale yel brn (10YR 6/2), fine-grained, some gravels, trace clay.			POOR SAMPLE RECOVERY 565 - 570'
570	BSC 00000 365	COARSE ANG SAND WITH FINE GRAVELS, Brn gry (5YR 4/1) OVERALL COLOR, COMPOSED OF MULTICOLOR GRAINS			
575	BSC 00000 366				CLEARED HOLE DOWN TO 575' FROM 0655 TO
580	BSC 00000 367				
585	BSC 00000 368				
590	BSC 00000 369				
595	BSC 00000 370				
600					

Prepared By JAMIE WALKER Date 12-4-98 Checked By J. M. MENAEN Date 1/4/99
KEN DONNELLSON NIGHT 12/5/98 DAY

NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

CUTTINGS SAMPLE LOG

Borehole ID NC-WASHBURN-1A Drill Depth From 600.0 To 658 T.D. Page 11 of 11
Driller EARL MANGUM/NEIL HALE Start Date/Time N/A End Date/Time N/A
Drilling Equip./Method SCHRAMM 685 DHH Sampling Equip./Method WET BUCKETS

DEPTH (Feet)	Top/Bottom of Cuttings Sample Interval	Description of Lithology - Petrology	GRAPHIC LOG	Lithologic Unit	Notes
605	BSC 00000 371	COARSE ANGULAR SAND WITH FINE GRAVELS, MULTICOLORED GRAINS			
	BSC 00000 372	Increased orange grains from 605-610'			
610	BSC 00000 373	Increased white, soft, opaque gravel (zeolite?) below 610			
615	BSC 00000 374				
620	BSC 00000 375				
625	BSC 00000 376				
630	BSC 00000 377				
635	BSC 00000 378	12/5/98 DAY SHIFT NIGHT SHIFT			Stopped drilling at 638' Started producing water at 1222, 12-5-98 ≈ 40gpm, 76-80°F STOPPED PUMPING @ 145G
640	BSC 00000 379	Coarse sand and gravels, multicolored, common dark red rhyolite pebbles/cobbles and grey glassy quartz porphyritic rhyolite pebbles (N7). Slightly coarser than Section 620-635'.			Resumed drilling after hydrological tests while awaiting arrival of geophysical logging
645	BSC 00000 380				
650	BSC 00000 381				
655	NO SAMPLE	hole stopped @ 658' for geophysical logging	NO SAMPLE		
			T.D.		