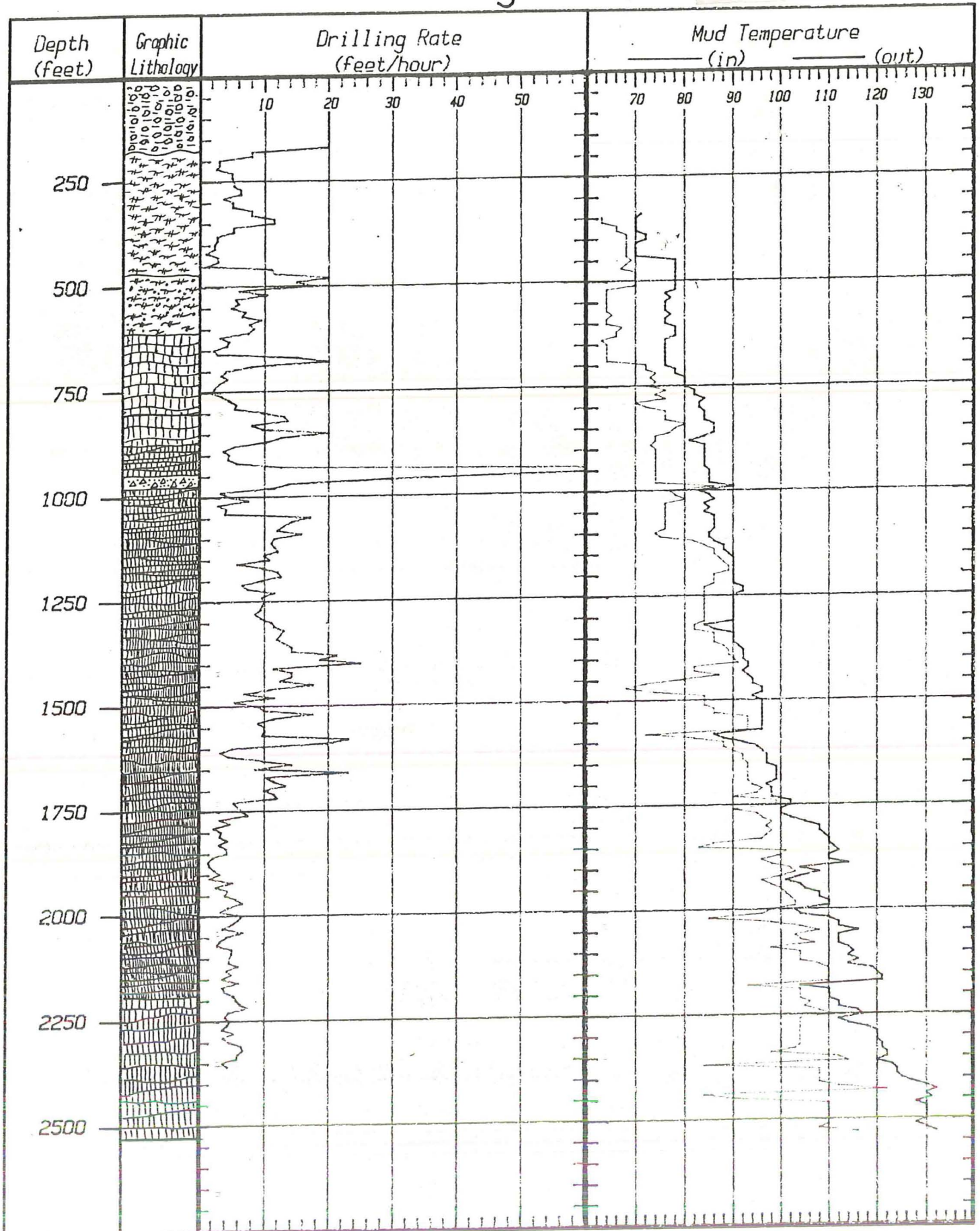


Baltazor Well #DH 45-14

Nevada

GL04485

Drilling Data



SOUTHWEST DRILLING & EXPLORATION, INC.

DRILLING HISTORY

HOLE NO: 45-14
SWDX JOB NO: 23-82

DATE	DEPTH	SUMMARY OF OPERATIONS
9/21/82	0- 0	Move rig to site. Build road and pad. Dig one mud pit and rig up.
9/22/82	0- 0	Continue to rig up and dig second mud pit.
9/23/82	0- 0	Finish digging mud pits. Haul water and mix mud. Send flat bed truck to pick up casing.
9/24/82	0- 36	Stir up mud pits. Spud hole at 7:30 am with 17 1/2" bit and drill to 36' in alluvial fan deposits. Set 12 1/4" surface casing to 36'. Mix cement and pump down outside of casing. Build and install flowline.
9/25/82	36- 190	Make up 8 3/4" bottom hole assembly and drill to 147'. Trip to check bit. Run in hole with 9 7/8" bit and ream from 36' to 147'. Drill to 190' with 9 7/8" bit. Drilling in alluvial fan deposits to 180', rhyolite to 190'.
9/26/82	190- 280	Drill to 200'. Trip to check bit and adjust rotary table clutch linkage. Drill to 207'. Trip to lay down stabilizer and drill to 280' in rhyolite with 9 7/8" bit.
9/27/82	280- 394	Drill to 312' and encounter lost circulation zone. Loose 1/2 pit of mud. Mix mud and LCM. Regain circulation. Drill to 394' in rhyolite.
9/28/82	394- 407	Mix mud. Drill to 407' in rhyolite. Trip out of hole and make up 12 1/4" hole opener. Ream hole from 36'.
9/29/82	407- 421	Continue to ream hole with 12 1/4" hole opener to 407'. Trip out to lay down hole opener. Clean mud pits and mix mud. Run in hole with 9 7/8" bit and drill to 417'. Trip to lay down stablizer. Run in hole and drill to 421' in rhyolite.
9/30/82	421- 442	Drill to 442' in rhyolite. Trip out of hole. Make up hole opener. Run in hole and ream hole with 12 1/4" opener from 407'.

DATE	DEPTH	SUMMARY OF OPERATIONS
10/01/82	442- 442	Continue to ream hole with 12 1/4" hole opener to 418'. Pull out of hole. Gearhart logging hole. Run 9 5/8" casing. Unable to get casing past 320'. Pull casing out of hole.
10/02/82	442- 442	Continue to pull casing out of hole. Make up stacked hole opener. Run in hole with 12 1/4" stacked hole opener. Ream to straighten hole from about 280'.
10/03/82	442- 442	Continue to ream hole to straighten down to 403'. Pull out of hole and lay down pipe. Run 9 5/8" casing to 402'. Cement casing; good returns. Wait on cement.
10/04/82	442- 442	Wait on cement. Dig cellar for BOPE. Cut off casing, weld on well head and install BOPE. Test BOPE; passes test. Clean mud pits. Make up 8 3/4" down hole assembly.
10/05/82	442- 525	Run in hole with 8 3/4" bit. Tagged cement at 369'. Condition mud. Drill to formation 428'. Trip to change to 6 3/4" bit and stablizer. Drill in altered rhyolite to 525'. 500' to 520' is vesicular rhyolite and ash tuff.
10/06/82	525- 649	Drill with 6 3/4" bit to 649'. Drilling in vesicular rhyolite to 570', and rhyolite to 610'. Lithology change at 610' to andesite where drilling slows.
10/07/82	649- 736	Drill with 6 3/4" bit to 660'. Trip to change bit and drill to 736' in andesite.
10/08/82	736- 750	Drill to 750'. Pull out of hole to switch from mud to air. Run in hole. Encounter too much water (~200 GPM). Pull out of hole. Switch to mud and ream hole.
10/09/82	750- 881	Continue to ream hole with 6 3/4" bit to 750'. Trip to change bit. Drill to 881'. Lithology change at 870' to basalt.
10/10/82	881-1018	Drill to 940' in basalt, to 970' in ash flow tuff, to 990' in basalt, to 1018' in basalt/clay. Trip out of hole at 990' to clean 6 3/4" bit and put in jets.
10/11/82	1018-1228	Continue to drill with 6 3/4" bit from 1018' to 1228' in basalt.

DATE	DEPTH	SUMMARY OF OPERATIONS
10/12/82	1228-1483	Drill from 1228' to 1483' with 6 3/4" bit. Drilling in basalt with blue clay.
10/13/82	1483-1612	Drill with 6 3/4" bit to 1490' (still in basalt with blue clay). Thin mud and drill to 1570' in basalt. Trip out of hole to check bit. Clean mud pits and run maintenance on rig. Mix mud and run in hole with 6 3/4" bit. Drill to 1612' in basalt.
10/14/82	1612-1750	Drill with 6 3/4" bit to 1750' in basalt. Circulate to clean hole and drop drift tool (bad run). Run in hole and mix mud.
10/15/82	1750-1804	Drop drift tool again (6 deg off). Trip out of hole. Maintenance. Mix mud and run in hole with 6 3/4" bit, drill in basalt to 1804'. Drilling with reduced weight on bit to straighten hole.
10/16/82	1804-1872	Drill with 6 3/4" bit from 1804' to 1872' in basalt with ash/tuff.
10/17/82	1872-1913	Drill with 6 3/4" bit to 1895'. Mix mud and continue down to 1913' in basalt. Drop drift tool (3.25 deg off). Pull out of hole. Run maintenance on rig.
10/18/82	1913-1954	Rig maintenance. Run in hole with new 6 1/2" bit. Drill to 1920'. Mix mud and continue to 1954' in basalt.
10/19/82	1954-2038	Drill to 1994' with 6 1/2" bit. Circulate and drop drift tool (5.75 deg off). Pull out of hole, maintenance, run in hole. Drill ahead to 2038' with 6 1/2" bit in basalt.
10/20/82	2038-2132	Drill ahead to 2132' in basalt with 6 1/2" bit. At 2064' added water to pit to reduce viscosity of mud. Rig maintenance at 2114'.
10/21/82	2132-2184	Drill ahead to 2184' in basalt with 6 1/2" bit. Open 3rd mud pit and mix mud. Pull out of hole - 10 buttons missing from bit. Install new 6 1/2" journal button bit, mix mud and run in hole. Circulate and run wireline deviation survey (3.75 deg off). Pull out of hole - plugged float. Clean mud pump and lines.
10/21/82	2184-2268	Run in hole. Mix and condition mud. Drill with 6 1/2" bit to 2268' in basalt to 2190', to 2268' in andesitic basalt. Water added to mud pits at 2194', 2206', and 2254'.

DATE	DEPTH	SUMMARY OF OPERATIONS
10/23/82	2268-2375	Drill ahead with 6 1/2" bit to 2300' mixing mud at 2294'. Run wireline deviation survey at 2300' (2.25 deg off). Drill ahead to 2375' mixing mud at 2354'. Drilling in andesitic basalt 2268' to 2375'.
10/24/82	2375-2462	Maintainance (repair pump clutch yoke). Drill ahead to 2400'. Circulate and run wireline deviation survey (2.00 deg off). Drill ahead to 2434'. Maintainance (change hoisting line). Drill ahead to 2462', mixing mud at 2454'. Andesitic basalt 2375' to 2462'.
10/25/82	2462-2529	Drill ahead to 2500' with 6 1/2" bit. Circulate and run wireline deviation survey (bad run). Drill ahead to 2513', circulate, and run survey again (5.00 deg off). Drill to 2529' in andesitic basalt. Pull out of hole.
10/26/82	2529-2529	Maintainance (clean and re-install hoist line clutch). Clean mud pits and mix mud. Maintainance (change battery on rig, air line on draw works, and check gear boxes). Run in hole and mix mud. Problems with hoisting line clutch, will not pull pipe. Pull out of hole.
10/27/82	2529-2529	Maintainance on hoisting line clutch.
10/28/82	2529-2529	Make up 8 5/8" hole opener. Run in hole to 475'. Stir mud pits and mix mud. Ream hole from 475' to 758'.
10/29/82	2529-2529	Ream hole with 8 5/8" hole opener from 758' to 796'.
10/30/82	2529-2529	Pull out of hole and lay down pipe. Pick up and load equipment.
10/31/82	2529-2529	Run temperature survey on hole. TD = 2430'.
11/01/82	2529-2529	Rig down. Move rig to Denio Junction. Remove mud from pits.

MUD LOG

HOLE NO: 45-14
SWDX JOB NO: 23-82

DATE: 9/24/82
CLIENT: Grace


DEPTH	DISCRPTION
20'-30'	Alluvial Fan deposits. - medium to coarse grain size with ~5% chips from larger size grains. grains are sub rounded to sub angular. 80% felsic igneous grains, 10% mafic igneous grains, the rest is quartz and feldspar grains. color ranges from red-brown to black-gray with some green-gray grains of epidote(?) some of the felsite is visicular.

DEPTH feet	RATE ft/hr	MUD TEMP in out			
			BIT SIZE: <u>17 1/2"</u>	AIR: _____	MUD: <u>x</u>
			CASING: <u>12 3/4"</u>	<u>0-36'</u>	VIS: _____
					WT: _____
					pH: _____
			NOTES: <u>Drilled to 36' with 17 1/2" bit.</u>		
			<u>Set 12 3/4" casing to 36' using</u>		
			<u>20-100lbs sacks of cement.</u>		
			Materials	hours	
			<u>20 100 lbs sack cement</u>	<u>8 1/2 hrs - drilling set</u>	
				<u>casing + cement</u>	

MUD LOG

HOLE NO: 25-14
 SWDX JOB NO: 22-25

DATE: 1/25/22
 CLIENT: _____

DEPTH	DISCRIPTION
30-40'	As above
40-50'	As above
50-60'	As above, but with % of felsic grains, higher % of angular chips.
60-70'	As above
70-80'	Alluvial Fan Deposits - layer of coarse chips (pebble sized) unto Mostly Rhyolitic 60%, 30% basaltic. few % gtz + feldspar grains.
80-90'	
90-100'	Increasing % of chip fragments with depth 
100-110'	
110-120'	
120-130'	
130-140'	
140-150'	
150-160'	
160-170'	
170-180'	<u>Rhyolite</u> - Purple-gray to reddish-gray rhyolite. Aphanitic ground mass with flow structure present on some fragments. <5% of the fragments have small vesicles. Phenocrysts of feldspar, gtz, and hematite (?) are present in amounts < 1%. Alteration products: yellow-green clay oxide-staining - calcite vein deposits. 5-10% of grains show alteration.
180-190'	<u>Rhyolite</u> - Rhyolite + alteration as above.

DEPTH feet	RATE ft/hr	MUD TEMP in out
36-47	20	
47-67	27	
67-87	20	
87-107	20	
107-127	20	
127-147	20	
147-167	20	
167-187	8	

BIT SIZE: $\frac{8\frac{3}{4}}{9\frac{7}{8}}$ to 147 to 190 AIR: _____ MUD: X

CASING: 12 $\frac{3}{4}$ " 0-36' VIS: _____

WT: _____

pH: _____

NOTES: Drilled to 147' with 8 $\frac{3}{4}$ " bit, then ream with 9 $\frac{7}{8}$ " bit from 36' to 147'. Drilled ahead to 190' with 9 $\frac{7}{8}$ "

Materials	hours
mud - 26	drill - 11 hrs
soda - 1	ream - 1.75
	main - .75
	mix mud - 1.75
	make up - 2.25

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: 23-82

DATE: 9/26/82
 CLIENT: Gmce

DEPTH	DISCRIPTION
180-190	Rhyolite - Aphanitic purple-gray, some chips (5%) with small vesicles, phenocrysts of feldspar (plagioclase) and quartz. Flow structure, micaceous. Alteration of frags along veins shown by oxide staining, vesicles frags show some staining. < 10% of oxide stain. Calcite veins present.
190-200	Rhyolite - Rock type as above but higher degree of alteration, significant calcite veining + iron sulfide.
200-210	Rhyolite - < 5% vesicular frags, ~5% show oxide staining. Calcite veining.
210-220	Rhyolite - little or no vesicular frags. yellow-green clay alteration product occurring on frags and in some cases comprising complete frags. 5-8% total. Calcite veining.
220-230	Rhyolite - < 5% show oxide stain. some calcite veins present.
230-240	Rhyolite - as above.
240-250	Rhyolite - as above.
250-260	Rhyolite - purplish-brown to purplish-gray, aphanitic groundmass. Phenocrysts of Qtz + hematite (?) which in some cases show a reddish-brown alteration ring. < 1% of grains have green-yellow clay. ~5% of fragments show reddish-yellow staining. Flow structure present on ~10% of fragments. little alteration + few if any calcite veins.
260-270	Rhyolite - As above with slightly more yellow-green clay (20% or more), and the presence of calcite veining.
270-280	Rhyolite - As above (in 260-270)

DEPTH feet	RATE ft/hr	MUD TEMP in out
187-207	3.1	
207-217	2.7	
217-237	5.0	
237-257	5.3	
257-277	6.3	

BIT SIZE: 9 7/8" AIR: _____ MUD: X
 CASING: 12 3/4" 0-36' VIS: _____
 WT: _____
 pH: _____

NOTES: Drilled from 190' to 280' with
9 7/8" bit

material hour:
 mud - 6 drill - 20.5
 trip - 2
 main - .75
 mud weight - .75

MUD LOG

HOLE NO: 45-14
SWDX JOB NO: 23-82

DATE: 7/28/82
CLIENT: Grace

DEPTH

DISCRIPTION

400-410

Rhyolite - As above, alteration as above.

DEPTH
feet

RATE
ft/hr

MUD TEMP
in out

397-407

2.4

BIT SIZE: 9 7/8" to 407
12 3/4" from 40 AIR: _____ MUD: X

CASING: 12 3/4" 0-3.2' VIS: _____

WT: _____

pH: _____

NOTES: Drilled with 9 7/8" bit to 407'.

Made up hole annular and began reaming
hole from 40' with 12 3/4".

netcut

hours

net

drill - 5

ream - 10

Trips - 3.5

make up, de aqu - 6.25

MIX MUD - 0.50

MUD LOG

HOLE NO: 45-14
SWDX JOB NO: 23-82

DATE: 9/29/82
CLIENT: Grace

DEPTH	DISCRIPTION
410-420	Rhyolite - As above, alteration as above.

DEPTH feet	RATE ft/hr	MUD in	TEMP out
407-417	3.8	68	70
417-421	1.1	68	70

BIT SIZE: 12 1/4" to 400'
9 7/8" to 421' AIR: _____ MUD: X
VIS: 56-58
CASING: 12 3/4" 0-36' WT: 11
pH: 9

NOTES: Finished reaming to 400' at 8 diam
run in hole with 9 7/8" from 407' to 421'

material hours
mud - 12 drill - 9.75 other - 2.25
ream - 2.25
Trip - 2.75
mix mud - 1

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: 23-82

DATE: 10/1/82
 CLIENT: Grace

DEPTH	DISCRIPTION

DEPTH feet	RATE ft/hr	MUD TEMP in out

BIT SIZE: 12 1/4" AIR: _____ MUD: λ
 VIS: 41-50
 CASING: 12 3/4" 0-36' WT: 15.7
 pH: 9
 NOTES: reamed hole with 12 1/4" to 718'.
Geohart Open logger note. Ran casing
(95%) but hit shaling at 10:30^p pulled out
casing.

MUD LOG

HOLE NO: 95-14
 SWDX JOB NO: 23-82

DATE: 10/2/82
 CLIENT: Grace

DEPTH	DISCRIPTION

DEPTH feet	RATE ft/hr	MUD TEMP in out			
			BIT SIZE: <u>12 3/4"</u>	AIR: _____	MUD: <u>1</u>
			CASING: <u>12 3/4" 8-36'</u>		VIS: _____
					WT: _____
					pH: _____
			NOTES: <u>Finished pulling casing, dressed hole opener + began reaming at 916 about 282' down to 343 mid night.</u>		
			<u>11 1/2 hrs</u>	<u>hours</u>	
			<u>mud - 50.00</u>	<u>ream - 14.25</u>	<u>110 11.25</u>
				<u>main - 2.25</u>	<u>pull casing - 2.25</u>
				<u>trip - 1.25</u>	
				<u>mud up - 3</u>	

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: 23-82

DATE: 10/5/82
 CLIENT: Grace

DEPTH	DISCRIPTION
440-450'	Rhyolite - Rhyolite as above, alteration as above.
450-460'	Rhyolite + Vesicular Rhyolite - Rhyolite as above with the addition of 10-20% vesicular fragments which are aphanitic. Also present is rhyolitic breccia in amounts of 5-10%. Alteration: Slight argillization of sample with oxide staining. Vesicular grains in most cases are filled with calcite or calcite clay(?). Breccia + vesicular grains more argillized.
460-470'	Rhyolite + Rhyolite breccia - Rhyolite + Alteration as described above but an increase of breccia to 10-20% of sample.
470-480'	As above but slightly increased argillization
480-490'	As above but increasing argillization of sample to clay and increased oxidation giving some of fragments a red-brown color. 5% light-gray ash or argillized grains. Possibly some fault gouge
490-500'	Vesicular Rhyolite - Aphanitic vesicular rhyolite with 15-20% rhyolitic chips without vesicles as described above. Alteration: Sample fairly well argillized more than above. Calcite + gfs as veins. Fault gouge occurs a light pink in color + soft. Oxidation to red-brown
500-510'	Vesicular Rhyolite - As above not as argillized

DEPTH feet	RATE ft/hr	MUD TEMP in	MUD TEMP out
440-450		69	78
450-460	11.5	68	78
460-470	11.5	67	78
470-480	20.0	70	78
480-490	15.0	70	78
490-500	17.5	70	78
500-510	6.1	70	78

BIT SIZE: 7 1/8" TO 428
6 1/4" TO 440 AIR: _____ MUD: X
6 3/4" TO 525 VIS: 34-34
 CASING: 12 3/4" 0-36 WT: 10.5
9 5/8" 0-402 pH: 9

NOTES: Drill out cement plug - bit formation at 428'. drill ahead with 6 3/4" to 525'.

mud - 10 hour
drill - 10 1/2 run - 1
liner - 2 top - 4 3/4 run + fuel - 4
run - 10 1/2 run - 1 1/2

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: 23-82

DATE: 10/6/82
 CLIENT: GMCC

DEPTH	DISCRIPTION
510-520	Vesicular Tuff - Light beige to brown vesicular ash fall(?) Tuff. Vesicles lined or filled with calcite(?). 10-20% rhyolite chips. The tuff crumbles easily and not all fragments have vesicles. Alteration: Some yellow-green clay and vein deposits of calcite.
520-530	Vesicular Tuff - As described above but % of fragments with vesicles decreasing.
530-540 540-550	Vesicular Rhyolite - Red brown oxidized vesicular rhyolite. Aphanitic groundmass. 50% contain vesicles. 10-20% light Tuff fragments. Alteration: Vesicles filled or lined + deposits on grains of clay + calcite, argillization.
550-560 560-570	Vesicular Rhyolite - Vesicular rhyolite as described above grains larger due to less argillization(?). Vesicles still lined or filled. little or no tuff appears.
570-580 580-590 590-600 600-610	Rhyolite - Red-brown rhyolite aphanitic groundmass. sample appears to be fairly well argillized. Calcite still the main vein deposit mineral. Horizon 590-600 appears to be a vesicular more mafic rock (possibly basalt?).

(continued)

DEPTH feet	RATE ft/hr	MUD in	TEMP out
510-520	10.3	64	78
520-530	5.6	64	76
530-540	6.0	64	77
540-550	5.0	64	76
550-560	7.0	64	76
560-570	6.6	64	76
570-580	9.4	65	77
580-590	7.7	64	76
590-600	8.3	64	76
600-610	7.5	67	78
620-630	3.3	66	78
630-640	4.0	66	78
650-660	4.3	68	76

BIT SIZE: 6 3/4" J55 AIR: _____ MUD: X
 CASING: 12 3/4" O-36 WT: 7.2-8.5
9 5/8" I-402 PH: 11-12

NOTES: drilling 525-619

material _____
 mud - 12 _____
 lian - 2 _____
 Drilling - 5 gal _____

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: 23-22

DATE: 10/7/82
 CLIENT: Grace

DEPTH	DISCRIPTION
640-650	Andesite - Andesite as described above. Alteration as described above. Flickensides still present on some grains. Fragments slightly smaller in size (more dense?).
650-660 660-670 670-680 680-690	Andesite - Andesite as described above. Alteration as described above. Fragment size slightly larger again.
690-700 700-710 710-720 720-730	Andesite - Andesite as described above. Alteration: little or no argillization, very little clay or vein deposits. little or no oxidation of whole grains mostly selected hornblende phenocrysts if any. From 690-700' there appears to be some fault gouge. Fragment size slightly larger 710'-720'.

DEPTH feet	RATE ft/hr	MUD in	TEMP out
640-650	2.4	64	76
650-660	2.8	64	76
660-670	15.0	64	76
670-680	22.0	64	76
680-690	7.9	64	76
690-700	4.2	72	76
700-710	3.5	72	78
710-720	4.3	74	78
720-730	3.2	73 - 80	

BIT SIZE: 6 3/4" TO 670'
6 1/4" TO 736' AIR: _____ MUD: X
 CASING: 12 3/4" O-26 VIS: 25 37
9 5/8" O-402 WT: 8.8
 pH: 11

NOTES: drill 247 with 6 3/4" bit to 670'
Trip + change bit to 6 1/4" drill to 736'

materials _____ hours _____
 deframer - 5 gal _____ drill - 21.5 _____
 _____ _____
 _____ _____
 _____ _____

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: 23-82

DATE: 10/8/82
 CLIENT: Grace

DEPTH	DISCRIPTION
<u>730-740</u>	<u>Andesite - Andesite + Alteration as described above.</u>
<u>740-750</u>	<u>Andesite - Andesite as described above. Alteration: increase in oxide staining of fragments (10-20%) and an increase in amount of yellow-green clay with the presence of fault gouge(?) Fragment size slightly smaller.</u>

DEPTH feet	RATE ft/hr	MUD TEMP in	TEMP out
<u>730-740</u>	<u>2.5</u>	<u>74</u>	<u>80</u>
<u>740-750</u>	<u>2.1</u>	<u>73</u>	<u>80</u>

BIT SIZE: 6 1/4" AIR: _____ MUD: X

CASING: 12 3/4" 0-36' VIS: 35 87
9 5/8" 0-402' WT: 2.7 23
 pH: 11

NOTES: Drilled to 750'. Rigged to drill with air.
Too much water for Air drilling. Ripped for mud.
Ran in hole w/ 6 3/4" bit. Ream hole from 670.

MISCELLANEOUS: _____
 M.T. = 12 drill = 6 1/2 ream = 6
 L.M. = 3 Trip = 3
 Spore Sp. = 1 Mix mud = 2 1/4
 Fluid = 5 Lub oil in mud = 6 1/4

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: 23-82

DATE: 10/9/82
 CLIENT: Grace

DEPTH	DISCRIPTION
750-760	Andesite - Andesite as described above. Alteration: little or no alteration - some staining (15%). Fault gouge present for the entire interval. little or no yellow-green clay.
760-770	
770-780	
780-790	
790-800	
800-810	
810-820	Andesite - Andesite as described above. Alteration: yellow-green clay 10-20% of grains show staining. little argillization
820-830	Andesite - Andesite as described above. Alteration: little or no clay 5-10% of grains show staining. little or no argillization. calcite veining(?)
830-840	Andesite - Andesite + Alteration as described above but fragment size slightly larger.
840-850	Andesite - Andesite as described above with the addition of a vesicular red-brown ash tuff (?). Vesicles lined or filled with calcite(?) + obsidian. Alteration: yellow-green clay calcite deposits. oxide staining (10-20%).
850-860	
860-870	Andesite to Basalt - Andesite as described above. red-brown ash tuff as described above. some obsidian. Some grains of basalt described below.
870-880	Basalt - Black-gray aphanitic Basalt. Massive structure, cryptocrystalline, with phenocrysts of plagioclase, pyroxene, + olivine(?). Alteration: minor staining, fault gouge.

DEPTH feet	RATE ft/hr	MUD in	TEMP out
750-760	3.4	76	82
760-770	4.6	74	82
770-780	5.7	76	84
780-790	5.5	70	83
790-800	9.7	72	83
800-810	13.0	76	84
810-820	13.6	76	84
820-830	8.1	76	84
830-840	9.7	80	86
840-850	20.0	78	86
850-860	12.5	77	86
860-870	10.3	74	84
870-880	5.5	74	81

BIT SIZE: <u>6 3/4"</u>	AIR: _____	MUD: <u>X</u>
CASING: <u>12 3/4"</u>	<u>0-36</u>	VIS: <u>38</u>
<u>4 1/2"</u>	<u>0-402</u>	WT: <u>8.6 8.7</u>
		pH: <u>11</u>

NOTES: Ream hole to 750'. Change bit new 6 3/4" and drill ahead to 881.

material	hours
<u>mud-23</u>	<u>drill-18 1/2 ream-2</u>
<u>LCM-2</u>	<u>trp-1 1/2</u>
	<u>mix mud-2</u>

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: 23-82

DATE: 10/10/82
 CLIENT: Grace

DEPTH	DISCRIPTION
880-890	Basalt - Basalt as described above with ^{magnetite} hematite (?). Alteration: Orange alteration of hematite. fault gouge and a little alteration of the basalt to clay (<5%). Some calcite veining.
890-900	
900-910	
910-920	
920-930	Ash flow tuff - light-gray white to brown white ash flow tuff. mostly washed out of sample. Remainder is basalt chips ^{4-20%} & obsidian ^{40-50%} + some quartz. Alteration: Blue + yellow-green clay filling veins + uugs.
930-940	Ash flow tuff - as above but 60-70% basalt 20-30% obsidian From 950-970 more of the ash is present.
940-950	
950-960	
960-970	
970-980	Basalt - Basalt as described above. Presence of <20% ash fragments. Alteration: staining of some grains. Calcite veining.
980-990	Basalt - Basalt as described above with the addition of some (<20%) vesicular basalt which is altered to a red-brown. Calcite veining + quartz veining.
990-1010	Altered Basalt - Basalt as described above (<20%). Bluish gray product of basalt alteration. Brown product of vesicular grains. Calcite + quartz veining yellow-green clay present.

DEPTH feet	RATE ft/hr	MUD TEMP	
		in	out
880-890	3.8	73	84
890-900	4.6	74	84
900-910	4.5	74	84
910-920	5.8	74	84
920-930	12.5	74	84
930-940	60.0	74	84
940-950	60.0	74	85
950-960	30.0	74	85
960-970	13.7	74	85
970-980	11.5	74	85
980-990	3.4	86	90
990-1000	4.8	77	83
1000-1010	7.5	78	85

BIT SIZE: 6 3/4" AIR: _____ MUD: X
 CASING: 12 3/4" 0-36' VIS: 37 34
9 5/8" 0-402' WT: 8.7 9
 PH: 11 10

NOTES: Drill with 6 3/4" to 990. Trip to
put in jets for clay. drill to 1018'

materials	hours
<u>Detergent-5</u>	<u>drill-22</u>
	<u>Trip-2</u>

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: 23-82

DATE: 10/11/82
 CLIENT: Grace

DEPTH	DISCRIPTION
1010-1020 1020-1030	Basalt - Basalt as described above with the presence of fault gouge + calcite as veins. Green serpentinized basalt (<1%) or clay. 1020-1030 less calcite as veins.
1030-1040 1040-1050	Basalt - Basalt as described above. Alteration: green clay or serpentinized basalt. Brown clay grains soft makes up ~20% of sample (Zones of altered basalt?) Some fault gouge (Little)
1050-1060 1060-1070 1070-1080	Basalt - Basalt with composition as described above but crystals slightly larger giving blockier appearance. Possibly from argillization(?) <5% brown clay fragments. Alteration of hematite in some grains. Calcite veining
1080-1090	Basalt - Basalt as described above. Much more argillized giving brown clay (~40%)
1090-1100 1100-1110 1120-1120 1120-1130 1130-1140	Basalt - Basalt as described above. Alteration: <1% Brown clay. ~5% green-gray clay? from argill Calcite veins.
1140-1150	Basalt - Basalt + Alteration as described above with the addition of oxidation of the magnetite to yellow-orange and less argillization of Basalt to green clay <5%.

DEPTH feet	RATE ft/hr	MUD TEMP in	MUD TEMP out
1010-1020	3.0	80	86
1020-1030	7.2	76	84
1030-1040	4.0	76	85
1040-1050	17.1	76	84
1050-1060	14.3	76	86
1060-1070	13.0	76	86
1070-1080	12.0	76	86
1080-1090	15.8	76	86
1090-1100	11.5	74	85
1100-1110	11.1	75	85
1110-1120	11.5	82	86
1120-1130	12.0	84	88
1130-1140	10.0	86	88
1140-1150	10.7	86	89
1150-1160	5.9	87	90

BIT SIZE: 6 3/4" AIR: _____ MUD: X
 CASING: 12 3/4" 0-36' VIS: 33 35
9 5/8" 0-402' WT: 9
 PH: 11 9

NOTES: drill ahead 1018' to 1228.

material _____
Mud - 8 drill - 22 3/4
Pump - 1 min mud - 1/4
1-21117-5 ml

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: 23-82

DATE: 12/12/82
 CLIENT: Grace

DEPTH	DISCRIPTION
1220-1230	Basalt - The basalt black to green-black or oxidized ⁵⁰⁻⁵⁰ to a red-brown. Alteration: Sample appears to slightly Argillized and the magnetite altered to yellow-orange. Calcite veining.
1230-1240	Basalt - Basalt as above. Alteration as above but with much more alteration of the magnetite (on 15% of grains).
1240-1250	Basalt - Basalt as above but black 80% red-brown 30%.
1250-1260	Alteration: As above but less alteration of magnetite
1260-1270	(on 5% of grains).
1270-1280	Basalt - Basalt as above <5% red-brown. Alteration
1280-1290	as above, but with less alteration of the
1290-1300	magnetite.
1300-1310	Basalt - Below this point basalt is argillized to the
1310-1320	point of almost a clay. crumbles fairly easily &
1320-1330	fragments are subrounded to subangular
1330-1340	Basalt - Basalt as above. Alteration as above 5% mag
	alteration
1340-1350	Basalt - Basalt + alteration as above <5% mag alter
1350-1360	But larger fragment size. maybe slightly
1360-1370	less argillization
1370-1380	
1380-1390	
1390-1400	
1400-1410	1420-1430
1410-1420	1430-1440

down to 140-1470

DEPTH feet	RATE ft/hr	MUD TEMP in out
1220-1230	11.5	84 92
1230-1240	9.7	84 92
1240-1250	10.0	84 90
1250-1260	9.7	84 90
1260-1270	9.4	84 90
1270-1280	8.6	84 90
1280-1290	9.4	84 90
1290-1300	11.1	84 90
1300-1310	11.5	84 90
1310-1320	13.0	82 84
1320-1330	12.5	82 86
1330-1340	12.0	86 90
1340-1350	13.0	86 90
1350-1360	14.3	86 90
1360-1370	14.3	88 91

BIT SIZE: 6 3/4" AIR: _____ MUD: X
 VIS: 35 36
 CASING: 12 3/4" 0-36' WT: 9.5 9.6
9 5/8" 0-402' pH: 11 9

NOTES: Drill ahead from 1228' to 1483'.

<u>materials</u>	<u>hours</u>
<u>mud - 8</u>	<u>drill - 22 3/4</u>
<u>cmc - 1/4</u>	<u>mix mud - 5/4</u>
	<u>main - 1/2</u>

Cont. 12/12/82

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: 23-82

DATE: 10/13/82
 CLIENT: Grace

DEPTH	DISCRIPTION
1480-1490	<u>Basalt</u> - Argillized to almost clay black-grny, m.c.c.
1490-1500	
1500-1510	
1510-1520	<u>Basalt</u> - Once again argillized to almost a clay, but not as bad as 1480-1490. Calcite ~5%
1520-1530	
1530-1540	
1540-1550	
1550-1560	<u>Basalt</u> - Argillized to almost clay as in 1480-1490 Calcite appears to amount of 5%
1560-1570	
1570-1580	<u>Andesit- Basalt(?)</u> - As above but with trace amounts of biotite upto 5%. Calcite to 50% - 10% ↳ Biotite from LCM
1580-1590	
1590-1600	<u>Basalt</u> - As in 1550-1560. Calcite ~10%
1600-1610	

DEPTH feet	RATE ft/hr	MUD TEMP in	MUD TEMP out
1480-1490	5.5	84	94
1490-1500	9.1	84	96
1500-1510	10.0	84	96
1510-1520	17.6	86	96
1520-1530	11.5	86	96
1530-1540	9.1	93	96
1540-1550	10.0	93	96
1550-1560	10.0	93	96
1560-1570	9.7	93	96
1570-1580	23.1	72	86
1580-1590	20.0	82	88
1590-1600	5.2	88	92
1600-1610	3.4	88	95

BIT SIZE: 6 3/4" AIR: _____ MUD: X
 VIS: 3.5 3.5
 CASING: 12 3/4" O-36 WT: 7.4 8.8
9 5/8" O-402 PH: 10 9

NOTES: Drill ahead 1483 to 1612.

materials	hours
mud - 23	dall - 1.5
Detergent - 10 gal	trip - 2 1/2
air - 2	main - 3 1/2
oil - 1/4	mix mud - 1 cup fit - 3
Lignite - 2	
LCM - 2	

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: 23-82

DATE: 10/14/82
 CLIENT: Grace

DEPTH	DISCRIPTION
1610-1620	Basalt-Andesite(?) - sample well argillized. ^{from FCM} bio life present frags black to purple-gray to red brown frags much smaller (fine to medium) Calcite present, qtz(?) present
1620-1630	Basalt-Andesite - as above with the presence of a red-clay ^{brown}
1630-1640 1640-1650	Basalt Vesicular - red brown clay still present. Some frags have vesicles filled with calcite. oxidation to magnetite. Red clay could be oxidized + leached contacts. Calcite present
1650-1660 1660-1670	Basalt - black-gray + green black basalt fragments + green possibly serpentine. calcite present 5%
1670-1680 1680-1690 ↓ 1750	Basalt - moderately argillized. calcite present. green-black + black fragments - green frags more argillized

DEPTH feet	RATE ft/hr	MUD TEMP in	MUD TEMP out
1610-1620	4.6		
1620-1630	9.7	92	97
1630-1640	14.3	92	97
1640-1650	8.6	93	97
1650-1660	23.1	93	99
1660-1670	10.3	93	99
1670-1680	11.5	93	99
1680-1690	13.0	93	99
1690-1700	10.0	94	97
1700-1710	11.5	96	98
1710-1720	12.0	95	98
1720-1730	5.4	90	98
1730-1740	6.0	99	102
1740-1750	6.7	99	102

BIT SIZE: 6 3/4" AIR: _____ MUD: X
 VIS: 35
 CASING: 12 3/4" 0-36' WT: 9
9 7/8" 0-402 PH: 9

NOTES: Drill ahead 1612-1750. Drop
drift tool at 1750'

Minerals - none
 Mud - 14 from - 16 1/2
 Drift - 5 top - 4 3/4
 Lignite - 1 in mud - 1 3/4
 Calc - 1/2 circ - 1

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: 23-82

DATE: 10/16/82
 CLIENT: Grace

DEPTH	DISCRIPTION
1800-1810	BASALT - Aphanitic, argillized black basalt chips w/ magnetite - some red-brn felsite chips, white-grey ash w/ Qtz + pliq xls 15% Alterations: secondary calcite + led-orange alteration of ferromagnesium minerals
1810-1820	(AS ABOVE)
1820-1830	(AS ABOVE)
1830-1840	(AS ABOVE) increasing white-grey ash/tuff - 30%
1840-1850	(AS ABOVE) " " "
1850-1860	(AS ABOVE) ash/tuff increasing to 45%
1860-1870	(AS ABOVE) ash/tuff decreasing to 20%

DEPTH feet	RATE ft/hr	MUD TEMP	
		in	out
1800-1810	3.3	98	108
1810-1820	4.4	97	109
1820-1830	3.2	96	110
1830-1840	4.3	86	110
1840-1850	4.4	83	111
1850-1860	2.3	101	112
1860-1870	1.6	100	110

BIT SIZE: 6 3/4" AIR: _____ MUD: X

CASING: 12 3/4" 0-36' VIS: 44 46
9 5/8" 0-402' WT: 9.9 9.7
 PH: 8 9

NOTES: Drilling ahead 1804' to 1872'
with 6 3/4" bit

Materials _____ hours _____
 _____ Drill - 24 _____

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: 23-82

DATE: 10/18/82
 CLIENT: GRACE

DEPTH	DISCRIPTION
1910-1920	<u>BASALT</u> - Aphanitic black basalt w/ magnetite 15% white-grey Tuff w/ plag + qtz xls - 10% grey clay Alteration: red-orange alteration of iron minerals, with minor calcite
1920-1930	(AS ABOVE)
1930-1940	(AS ABOVE)
1940-1950	(AS ABOVE) decreasing clay fraction
1950-1960	<u>BASALT</u> - Aphanitic black-brown basalt (AS ABOVE)

DEPTH feet	RATE ft/hr	MUD TEMP in out
<u>1910-1920</u>	<u>2.8</u>	<u>96 101</u>
<u>1920-1930</u>	<u>4.4</u>	<u>98 104</u>
<u>1930-1940</u>	<u>4.1</u>	<u>100 105</u>
<u>1940-1950</u>	<u>5.7</u>	<u>101 108</u>
<u>1950-1960</u>	<u>6.7</u>	<u>102 108</u>

BIT SIZE: 6 1/2" HPSMJ AIR: _____ MUD: X
 VIS: 40
 CASING: _____ WT: 9.5
 pH: 9

NOTES: BIT CHANGE @ 1913' - 6 1/2" REED HPSMJ
JOURNAL BUTTON BIT

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: 23-82

DATE: 10/19/82
 CLIENT: GRACE

DEPTH	DISCRIPTION
1960-1970'	<u>BASALT</u> - Aphanitic black to red-brn basalt w/ magnetite 10% white-grey tuff Alteration: minor calcite & alteration of iron minerals
1970-1980'	(AS ABOVE)
1980-1990'	(AS ABOVE)
1990-2000'	<u>BASALT</u> - Aphanitic black to red-brn basalt 25% white-grey-green tuff Alteration of iron minerals & minor calcite
2000-2010	(AS ABOVE)
2010-2020	(AS ABOVE) w/ 10% tuff
2020-2030	(AS ABOVE)
2030-2040	AS ABOVE w/ 25% clay-tuff

DEPTH feet	RATE ft/hr	MUD TEMP in out
<u>1960-1970</u>	<u>4.6</u>	<u>103-110</u>
<u>1970-1980</u>	<u>3.5</u>	<u>103-110</u>
<u>1980-1990</u>	<u>6.7</u>	<u>98-103</u>
<u>1990-2000</u>	<u>6.1</u>	<u>96-104</u>
<u>2000-2010</u>	<u>5.2</u>	<u>85-110</u>
<u>2010-2020</u>	<u>3.8</u>	<u>98-112</u>
<u>2020-2030</u>	<u>6.8</u>	<u>104-112</u>
<u>2030-2040</u>	<u>4.4</u>	<u>108-116</u>

BIT SIZE: 6 1/2 AIR: _____ MUD: X
 VIS: 45-50 out
 CASING: _____ WT: 9.0
 pH: 8.0

NOTES: RUN DEVIATION SURVEY @ 1994'
5.75° OFF VERTICAL

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: 23-82

DATE: 10/20/82
 CLIENT: GRACE

DEPTH	DISCRIPTION
2040-2050	BASALT - Black aphanitic basalt w/ magnetite 20% grey tuff w/ plag + Qtz xls + biotite red-orange alteration of iron minerals w/ white calcite
2050-2060	(AS ABOVE) (MASSIVE FROM 2048-2055)
2060-2070	(AS ABOVE) (MASSIVE FROM 2062-2071)
2070-2080	(AS ABOVE) w/ 10% tuff
2080-2090	(AS ABOVE) decreasing tuff, black to red-brown basalt chips
2090-2100	(AS ABOVE)
2100-2110	(AS ABOVE) w/ increased alteration of ferro magne minerals
2110-2120	(AS ABOVE) white clay tuff
2120-2130	(AS ABOVE)

DEPTH feet	RATE ft/hr	MUD TEMP	
		in	out
2040-2050	3.4	103	112
2050-2060	2.9	104	112
2060-2070	5.1	107	112
2070-2080	5.1	98	114
2080-2090	4.9	104	115
2090-2100	4.7	104	114
2100-2110	6.0	104	116
2110-2120	4.4	108	114
2120-2130	5.0	110	119

BIT SIZE: 6 1/2 AIR: _____ MUD: X
 VIS: 40
 CASING: _____ WT: 9.6
 pH: 9

NOTES: _____

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: 23-82

DATE: 10/22/82
 CLIENT: GRACE

DEPTH	DISCRIPTION
2184 @ MIDNITE	
2180-2190	BASALT - ANDESITIC BASALT TRANSITION
2190-2200	<u>ANDESITIC BASALT</u> Grey-green microporphyrific andesitic basalt with calcite micro veins, plagioclase micro phenocrysts some magnetite - 5-10% white to red crystal tuff - Qtz, plag & biotite xls - Alterations: secondary calcite & some red-orange alteration of ferromagnesium minerals
2200-2210	(AS ABOVE)
2210-2220	(AS ABOVE)
2220-2230	(AS ABOVE)
2230-2240	(AS ABOVE)
2240-2250	(AS ABOVE)
2250-2260	(AS ABOVE)
2268' @ MIDNITE	

DEPTH feet	RATE ft/hr	MUD TEMP in	MUD TEMP out
2180-2190	5.8	104	110
2190-2200	16.4	104	110
2200-2210	7.5	106	112
2210-2220	4.7	105	112
2220-2230	4.2	108	116
2230-2240	4.9	111	117
2240-2250	4.5	104	112
2250-2260	3.8	104	114

BIT SIZE: 6 1/2 AIR: _____ MUD: X
 CASING: _____ VIS: 42
 _____ WT: 9.4
 _____ pH: 9.0

NOTES: _____

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: _____

DATE: 10/23/82
 CLIENT: GARKE

DEPTH	DISCRIPTION
2268 MID	
2260-2270	ANDESITIC BASALT - Grey-green microporphyrific andesitic basalt waxy luster on some chips, plagioclase microphenocrysts with some magnetite calcite veins and chips - 5-10% white to red crystal tuff - plagioclase & biotite xls - Alteration: secondary calcite and red orange alteration of ferromag minerals
2270-2280	(AS ABOVE)
2280-2290	(AS ABOVE)
2290-2300	(AS ABOVE)
2300-2310	(AS ABOVE)
2310-2320	(AS ABOVE)
2320-2330	(AS ABOVE)
2330-2340	(AS ABOVE)
2340-2350	(AS ABOVE)
2350-2360	(AS ABOVE)
2360-2370	(AS ABOVE)
2375 MIDDLE	

DEPTH feet	RATE ft/hr	MUD TEMP in	MUD TEMP out
2260-2270	5.4	104	118
2270-2280	3.9	104	120
2280-2290	4.7	104	120
2290-2300	6.5	104	120
2300-2310	6.8	104	121
2310-2320	6.1	103	121
2320-2330	5.9	98	122
2330-2340	3.8	112	122
2340-2350	4.5	114	120
2350-2360		84	123
2360-2370		108	124

BIT SIZE: 6 1/2 HPSMT AIR: _____ MUD: X
 VIS: 54-46 cut
 CASING: _____ WT: 9.4
 pH: 9

NOTES: P111 LEAK IN SH. 14 @ 2300' → 2 1/4" OFF
VERTICAL

MUD LOG

HOLE NO: 45-14
 SWDX JOB NO: _____

DATE: 10/24/82
 CLIENT: SPICE

DEPTH	DISCRIPTION
2375 m/d	
2370-2380	<u>ANDESITIC BASALT</u> - Grey-green, microporphritic andesitic basalt wavy, sugary luster - plagioclase phenocrysts - calcite chips and veins in basalt - 5 to 10% white, yellow, & red clay-tuff w/ xls of pbq qtz and biotite - Alteration of ferromag minerals to red and/or hematite-goethite? and some brown-gray clay
2380-2390	(AS ABOVE)
2390-2400	(AS ABOVE)
2400-2410	(AS ABOVE)
2410-2420	(AS ABOVE)
2420-2430	(AS ABOVE)
2430-2440	(AS ABOVE)
2440-2450	(AS ABOVE)
2450-2460	(AS ABOVE)
2470 @ MIDNITE	

DEPTH feet	RATE ft/hr	MUD TEMP in out
2370-2380		108 124
2380-2390		108 124
2390-2400		108 125
2400-2410		108 127
2410-2420		112 130
2420-2430		122 132
2430-2440		84 130
2440-2450		90 131
2450-2460		110 122

BIT SIZE: 6 1/2" 112/105 AIR: _____ MUD: X
 CASING: _____ VIS: 46-47
 WT: 9.7
 pH: 9

NOTES: RUN DEVIATION SURVEY AT 2400' -
2° OFF VERTICAL

INCREASE WEIGHT ON BIT TO 1800#