

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 100

Summary of the Dakota Drilling Co. Ole Anderson #1
Bottineau County, North Dakota
Well #524 - Permit #531

By Clarence G. Carlson

Dakota Drilling Company - Ole Anderson #1, Bottineau County, North Dakota, C SE NW Section 19, T.161N. ,R.81W. Elevation 1520 D.F. - 1513 G.L.

The Ole Anderson was spudded March 19, 1954 and completed as a dry hole April 7, 1954 at a total depth of 6604 feet, surface casing (10 3/4") was set at 437 feet and left in hole. Plugs were set at 2520-2460, 20 sacks, 395-425, 15 sacks and 5 sacks at surface.

TESTS

DST #1 - 4041-4048

Tool open 3 hours, shut in 15 minutes, recovered slightly sulfurous mud, FP-0-60#, SIP-420#, HP-2235#.

DST #2 - 4092-4125

Tool open 2 1/2 hours, recovered 90 feet slightly gas cut mud, 180 feet oil and gas cut mud, 90 feet oily mud, 180 feet muddy oil, 440 feet free oil, estimated 35 gravity, 510 feet sulfur water. FP-50-550#; 30 SIP-1800#, HP-2200#.

DST #3 - 4531-4557

Tool open 2 hours, recovered 525 feet salty sulfur water. FP-0-350#, 30 minutes SIP-1925#, HP-2700#.

Perforated 4100-4106

Swabbed 5.5 B.O. and 1.8 B.W. per hour; swabbed 4.3 B.O. and 1.3 B.W. per hour; swabbed 4.9 B.O. and .7 B.W. per hour, swabbed 25 B.O. and 17 B.W. for 5 hours. Swabbed 54 barrels of water cut oil and 30 B.W. in 24 hours.

Perforated 4038-4090

Acidized with 4000 gallons acid. Swabbed little oil and acid water. Swabbed 9 B.W. and 2 B.F. per hour. Considered non-commercial.

Formation tops picked from samples, and neutron log. Not all lithologic tops were called in following list.

FORMATION TOPS

Cretaceous System	
Greenhorn Formation	1910
Dakota	2515
Jurassic System	
Sundance Formation	2765
Triassic System	
Spearfish Formation	3600

Mississippian System	
Charles Formation	3865
Mission Canyon Formation	4035
Lodgepole Formation	4415
Englewood Formation	5015
Devonian System	
Lyleton Formation	5040
Nisku Formation	5110
Duperow Formation	5225
Souris River Formation	5595
Dawson Bay Formation	5785
Prairie Evaporite	6090
Winnipegosis Formation	6220
Ashern Formation	6310
Silurian System	
Interlake Group	6335
Total Depth	6604

880-900	Shale, medium gray, bentonitic.
900-960	Shale, medium gray, bentonitic, little pyrite.
960-1000	Shale, medium gray, slightly bentonitic, little pyrite.
1000-1080	Shale as above.
1080-1160	Shale, medium gray, slightly bentonitic, micaceous, little pyrite.
1160-1180	Shale, medium gray.
1180-1220	Shale, medium gray, little pyrite, micaceous.
1220-1260	Shale, medium gray, micaceous.
1300-1400	Shale, medium gray, micaceous, pyrite.
1400-1440	Shale, medium gray, bentonitic, pyrite, mica.
1440-1460	Shale, medium gray, bentonitic, pyrite, mica, shell fragments.
1460-1500	Shale, medium gray, bentonitic, pyrite.
1500-1540	Shale, medium to medium dark gray, white bentonite, layers pyrite.
1540-1600	Shale, medium to medium dark gray, bentonitic, pyrite.
1600-1660	Shale, medium gray, pyrite.
1660-1680	Shale as above.
1680-1720	Shale, medium gray and dark gray, pyrite, little white bentonite.
1720-1760	Shale, medium gray and dark gray, pyrite.
1760-1780	Shale, medium gray.
1780-1800	Shale, medium gray, pyrite.
1800-1840	Shale, medium gray and dark gray, pyrite.
1840-1860	Shale, dark gray and medium gray, pyrite.
1860-1880	Shale, dark gray and medium gray, slightly bentonitic, pyritic.
1880-1900	Shale as above.
2100-2120	Shale, dark gray, shell fragments.
2120-2140	Shale, dark gray and medium gray.
2140-2160	Shale, dark gray, little white bentonite, few white specks.
2160-2180	Shale, dark gray, some white specks, shell fragments.
2180-2200	Shade as above, white specks, little limestone light gray, fragmental, silty.
2200-2220	Limestone as above, some shale as above.
2220-2260	Shale, dark gray.
2260-2280	Shale, dark gray, fossil, Pelecypod?
2280-2320	Shale, dark gray, fossil fragments and impressions.

2320-2360 Shale as above.
 2360-2400 Shale, dark gray, shell fragments, pyrite.
 2400-2460 Shale, medium to dark gray, shell fragments.
 2460-2480 Shale, medium dark gray, pyrite, shell fragments.
 2480-2500 Shale as above, little sandstone, pale brown, fine grained.
 2500-2520 Shale, medium light gray, pyrite, shell fragments.
 2520-2540 Shale, medium light gray, dark gray, pyrite.
 2540-2560 Shale, medium light gray, silty, calcareous, dark gray, little sandstone pale brown, fine grained, slightly calcareous.
 2560-2580 Shale as above, little sandstone as above, fossil, *Nodosaria*.
 2580-2600 Shale as above.
 2600-2620 Sandstone, colorless, medium to coarse grained, little calcite cement, subrounded, shale as above.
 2620-2640 Sandstone, colorless to light gray, medium to coarse grained, poorly sorted, calcite cement, shale dark gray, pyrite.
 2640-2660 Sandstone, colorless to light gray, medium to coarse grained, calcite and pyrite cement.
 2660-2740 Shale, medium light gray and medium dark gray, pyrite.
 2740-2780 Shale, medium gray, pyrite, little sandstone, medium to coarse grained, calcite and pyrite cement.
 2780-2800 Shale, medium to medium light gray.
 2820-2840 Sandstone, colorless, medium to coarse grained, subangular, pyrite and calcite cement, shale as above.
 2840-2900 Shale, dark gray, platy.
 2900-3130 Missing.
 3130-3140 Shale, dark gray and light greenish gray.
 3140-3150 Shale, dark gray and light brownish gray, platy, pyrite.
 3150-3160 Shale as above, little white anhydrite.
 3160-3170 Shale as above, little light gray, micaceous bentonite.
 3170-3180 Shale, dark gray and light brownish gray, platy.
 3180-3200 Shale, variegated, light brownish gray, light greenish gray, flaky, dark gray, platy, little red siltstone.
 3200-3210 Shale as above.
 3210-3300 Missing.
 3300-3310 Shale, variegated, dark gray, light brownish gray, light greenish gray, grayish red, mostly dark gray.
 3310-3360 Missing.
 3360-3370 Shale, variegated, grayish brown, grayish green, little pink anhydrite, siltstone, reddish brown.
 3390-3410 Shale, variegated as above, little anhydrite, pyrite.
 3410-3420 Shale, variegated, greenish gray, reddish brown, dark gray, sandstone, light gray, medium subrounded.
 3420-3430 Shale, variegated as above, sandstone as above, little limestone, light gray, microcrystalline, dense.
 3430-3440 Shale as above, little sandstone and limestone as above, little white anhydrite.
 3440-3450 Limestone, white, sublithographic, much variegated shale.
 3450-3467 Shale, dark gray, platy.
 3467-3477 Shale, variegated, limestone, white, sublithographic, and pale orange, microcrystalline, dense, dolomitic.
 3480-3490 Shale, variegated.
 3490-3510 Shale, variegated, limestone, light gray, microcrystalline, pyrite.

3510-3520 Shale, variegated, limestone as above, sandstone, light gray, medium grained, calcite cement.

3520-3530 Shale, variegated, dark gray, reddish brown, greenish gray, limestone white to light gray, microcrystalline.

3530-3560 Limestone, light gray, microcrystalline, much shale, variegated.

3560-3570 Anhydrite, white, dense, much shale variegated.

3570-3580 Limestone, light gray, microcrystalline, much shale, variegated.

3580-3600 Shale, variegated, anhydrite, white granular.

3600-3620 Shale, variegated, anhydrite, little sandstone, medium grained, glauconitic.

3620-3630 Shale as above, anhydrite, sandstone, pale reddish brown, medium grained.

3630-3640 Sandstone, pale reddish brown, fine grained, slightly calcareous, anhydrite, shale, variegated.

3640-3650 Sandstone as above, anhydrite, much variegated shale.

3650-3660 Sandstone as above, anhydrite, much shale as above, some dolomite, light olive gray, dense.

3660-3670 Sandstone as above, anhydrite, much shale as above.

3680-3720 Sandstone, moderate reddish orange, fine to medium grained, some shale, variegated, little anhydrite.

3720-3730 Sandstone, moderate reddish orange, fine to coarse, rounded, frosted, poorly sorted, very friable.

3730-3740 Shale, variegated, greenish gray, brownish gray, medium gray, platy, some sandstone as above.

3740-3770 Sandstone as above, shale, variegated as above and reddish brown.

3770-3790 Sandstone as above, anhydrite.

3790-3800 Sandstone, grayish pink, fine to coarse, rounded, frosted, friable, calcite.

3800-3820 Sandstone, moderate reddish orange, fine to coarse, rounded, frosted, very friable, calcareous.

3820-3850 Sandstone as above, anhydrite.

3850-3860 Sandstone as above, some variegated shale.

3860-3870 Shale, variegated, mostly dark gray, some sandstone as above.

3870-3880 Limestone, white to light gray, microcrystalline.

3880-3890 Limestone, white to light gray, medium grained, fair porosity.

3890-3910 Limestone, white to light gray, microcrystalline.

3910-3930 Anhydrite, white, microcrystalline, dense, some limestone as above.

3925 Circulation, anhydrite, light gray, dense, shale variegated.

3930-3940 Limestone, yellowish gray, fine to medium grained, some anhydrite as above.

3944 Circulation 1/4 hour, limestone as above, dolomite, pink, microcrystalline, anhydrite as above.

3940-3960 Anhydrite, white, dense.

3960-3980 Anhydrite, white, dense and medium grained.

3980-3990 Anhydrite, dense, white, poor sample.

3990-4040 Anhydrite, bluish white, dense.

4040-4050 Anhydrite as above, limestone yellowish gray, finely crystalline, dolomite.

4050-4070 Limestone as above.

4075 Circulation 15 minutes, limestone as above, anhydrite, white dense and granular, shales, variegated.

4075 Circulation 1/2 hour, limestone, yellowish gray, fine grained.

4075 Circulation 1 hour, limestone as above.

4075-4085 Limestone as above
 4081 Circulation 1/2 hour, limestone as above, shale variegated.
 4081 Circulation 1 hour, limestone as above, anhydrite, white, dense and medium grained, shales, variegated.
 4081 Circulation 1 1/2 hours, limestone, anhydrite, shale as above.
 4085-4095 Limestone as above.
 4095-4100 limestone as above, and pale red 5R6/2, dense.
 4100-4120 Limestone, yellowish gray, medium grained to fine grained.
 4120-4135 Limestone as above, some brownish gray, granular, fair porosity.
 4135-4155 Limestone, yellowish gray, sublithographic, slight porosity.
 4155-4165 Limestone, pale yellowish gray, fine grained and some oolitic.
 4165-4175 Limestone, light gray, oolitic.
 4179-4185 Limestone, light gray, oolitic.
 4185-4200 Limestone, yellowish gray, sublithographic, with recrystallized calcite.
 4218 Circulation 1 hour, limestone, yellowish gray, fine grained, fair porosity, sandy.
 4218 Circulation 1 1/4 hour, limestone as above.
 4225-4230 Limestone, light gray, microcrystalline.
 4230-4235 Limestone, light bluish gray, microcrystalline, dolomitic.
 4235-4240 Limestone as above and yellowish gray, oolitic.
 4240-4260 Limestone, yellowish gray, fine grained and oolitic.
 4260-4279 Limestone, yellowish gray, fine grained.
 4279 Circulation 1/2 hour, limestone, yellowish gray, fine grained and oolitic, fair porosity.
 4279 Circulation 1 hour, limestone, yellowish gray, oolitic, slight porosity.
 4279 Circulation, 1 1/4 hour, limestone as above.
 4279-4310 Limestone, yellowish gray, oolitic.
 4310-4315 Limestone, light brownish gray, fine grained, dolomitic, fair porosity.
 4315-4335 Limestone as above, dolomite, brownish gray, dense.
 4335-4350 Limestone, yellowish gray, fine grained and oolitic.
 4350-4360 Limestone, yellowish gray, oolitic.
 4360-4385 Limestone, light gray, fine grained to sublithographic.
 4385-4395 Limestone, yellowish gray, oolitic.
 4395-4415 Limestone, yellowish gray, fine grained, brachiopod fragments, also some oolitic.
 4415-4425 Limestone, light grey, fine grained.
 4429 Circulation 1/2 hour, limestone as above, shale dark gray.
 4429 Circulation 1 hour, limestone, light gray, fine grained and fragmental. Shale, variegated.
 4429 Circulation 1 1/2 hour, limestone as above, shale as above.
 4429-4440 Limestone, light gray, finely crystalline.
 4440-4450 Limestone, light to medium gray, microcrystalline, shell fragments.
 4450-4455 Limestone, light to medium gray, microcrystalline, brachiopod fragments.
 4455-4460 Limestone as above, gastropod fragment?
 4460-4475 Limestone, light gray to medium gray, fragmental, brachiopod fragments.
 4475-4480 Limestone, yellowish gray, oolitic.
 4478 Circulation 1/4 hour, limestone, light gray, fragmental, shale variegated, pyrite, gypsum.

4478 Circulation 1/2 hour, limestone as above, shale as above.
4478 Circulation 3/4 hour, limestone, light gray to yellowish brown, oolitic.

4480-4490 Limestone, light to medium gray, oolitic.
4490-4495 Limestone, light to medium gray, fine grained.
4495-4500 Limestone, light yellowish gray, to medium gray, fine grained, shell fragments, ostracods.

4500-4530 Limestone, light gray, fine grained, fragmental, brachiopod fragments, pyrite.
4530-4540 Limestone, light gray, fine to medium grained, brachiopod, pyrite.
4545-4550 Limestone, light gray, fine to medium grained.
4554 Circulation 1/4 hour, limestone as above, shale as above, pyrite.
4554 Circulation 1/2 hour, limestone and shale as above.
4560-4565 Limestone, light to medium gray, microcrystalline.
4565-4585 Limestone, light gray, fine grained, fragmental, brachiopod fragments.
4585-4595 Limestone, light gray, fine grained, brachiopod fragments, ostracods.

4595-4615 Limestone, yellowish gray, fragmental, clear crystalline quartz, shell fragments.
4615-4625 Limestone, yellowish gray, fine grained, shell fragments.
4625-4630 Limestone, yellowish gray, fine grained fragmental, clear crystalline quartz.

4630-4665 Limestone, light gray, fine grained, brachiopod fragments.
4665-4675 Limestone, light to medium gray, fine grained, earthy.
4675-4680 Limestone as above, brachiopod fragments.
4680-4690 Limestone, medium light gray, microcrystalline.
4690-4705 Limestone, light to medium gray, fine grained, earthy.
4705-4720 Limestone, medium light gray, microcrystalline, dense.
4720-4735 Limestone as above, dolomite, light gray, dense.
4740-4760 Limestone, light gray, fine grained, fragmental, brachiopod fragments.

4760-4775 Limestone, yellowish gray to light gray, fine grained.
4775-4780 Limestone, light to medium gray, fine grained, brachiopod fragments, ostracods.

4780-4790 Limestone, light gray, fine grained, earthy, ostracod.
4790-4805 Limestone, light gray, fine grained, earthy.
4805-4810 Limestone as above, brachiopod fragments.
4810-4840 Limestone, light gray, fine grained, earthy.
4840-4900 Limestone, light gray, microcrystalline, dense.
4900-4920 Limestone, light gray, fine grained, earthy, shell fragments.
4920-4930 Limestone, light to medium gray, fine grained, dolomitic, pyrite.
4930-4935 Limestone, light gray, medium gray, fine grained, dolomitic, shell fragments, ostracods.

4935-4945 Limestone as above, pyrite.
4945-4955 Limestone, light to medium gray, fine grained, shell fragments, ostracods, pyrite.

4955-4965 Limestone as above, ostracods, pyrite, chert, light gray.
4965-4975 Limestone, light to medium gray, fine grained, pyrite.
4975-4985 Limestone as above, shell fragments, chert, light gray, ostracods.
4985-5000 Limestone, light to medium gray, fine grained, shell fragments.
5000-5010 Limestone, very light gray, fine grained, ostracods.
5010-5020 Limestone, very light gray to white, fine grained.
5021 Circulation 1/2 hour, limestone as above, shell fragments, chert.

5021 Circulation 1 hour, limestone as above, shale, grayish black.

5020-5030 Limestone, light gray to white, fine grained, few shell fragments, pyrite, little shale as above, little chert, light gray.

5030-5055 Dolomite, light gray, microsucrosic, limey, pyrite.

5050 Circulation 3/4 hour, limestone, pale red 10R6/2 to grayish orange, fine grained, silty.

5055-5065 Limestone, pale red, fine grained, silty, dolomitic.

5065-5075 Limestone as above, little shale, pale green, calcareous.

5075-5090 Dolomite, reddish brown, fine grained, silty, limey.

5090-5095 Limestone, grayish orange, fine grained, dolomitic, shale, pale green, calcareous.

5095-5110 Dolomite, reddish brown, fine grained, silty, limey anhydrite, white crystalline, shale as above.

5110-5120 Dolomite, reddish brown to pale red, silty, limey.

5120-5125 Dolomite as above, shale, dark gray, pale green.

5125-5130 Dolomite, light gray, fine grained.

5130-5150 Dolomite, light grayish orange, fine grained.

5150-5160 Limestone, grayish orange, fragmental to fine grained.

5160-5170 Limestone as above, anhydrite, white.

5172 Circulation 1/2 hour, limestone, dolomite and anhydrite as above.

5172 Circulation 1 hour, limestone, yellowish gray, fine grained.

5170-5175 Limestone as above.

5175-5190 Dolomite, light brownish gray, microsucrosic.

5195-5205 Dolomite, light brownish gray, microsucrosic, limey.

5205-5225 Limestone, brownish gray, fine grained.

5225-5235 Limestone, light brownish gray, fine grained.

5235-5240 Dolomite, light brownish gray, microsucrosic, some limestone as above.

5240-5250 Limestone, light gray to white, finely crystalline.

5250-5255 Limestone as above, and brownish gray, fine grained.

5256 Circulation 1/2 hour, limestone as above.

5256 Circulation 3/4 hour, limestone, brownish gray, fine grained.

5256 Circulation 1 hour, limestone as above, dolomite, brownish gray, microsucrosic.

5256 Circulation 1 1/4 hours, dolomite and limestone as above.

5255-5275 Dolomite, brownish gray, microsucrosic, fair porosity.

5280-5285 Limestone, light gray to brownish gray, fine grained and fragmental.

5285-5300 Dolomite, light gray, finely crystalline, pyrite.

5300-5315 Dolomite as above, some limestone, pale orange, fragmental.

5315-5325 Dolomite as above, also brownish gray, microsucrosic, some limestone, yellowish gray, fine grained.

5325-5330 Limestone, yellowish gray, fine grained, dolomite, brownish gray microsucrosic.

5330-5340 Limestone as above, dolomite, light gray, finely crystalline.

5340-5345 Limestone, brownish gray, microsucrosic, dolomite as above.

5345-5355 Limestone, brownish gray, microsucrosic, and finely crystalline, dolomitic.

5355-5385 Limestone, brownish gray, fine grained, dolomitic, fair intergranular porosity,

5385-5395 Dolomite, brownish gray, fine grained, pinpoint porosity.

5395 Circulation 1/2 hour, dolomite as above, limestone as 5355-85.

5395 Circulation 1 hour, limestone, brownish gray, fine grained, dolomite, light gray, fine grained.

5395 Circulation 1 1/4 hours, limestone and dolomite as above.

5395-5410 Limestone, brownish gray, fine grained, dolomite, light gray, fine grained, ostracods.

5410-5415 Dolomite as above, and brownish gray, fine to medium grained, limestone as above.

5415-5420 Dolomite as above, anhydrite, white, limestone as above.

5420-5430 Limestone, light yellowish gray, finely crystalline, dolomite as above.

5430-5440 Dolomite, brownish gray, fine grained, limestone as above.

5440-5445 Dolomite as above, poor sample.

5445-5450 Dolomite, light brownish gray, fine grained, anhydrite, light gray, limestone, yellowish gray, fine grained.

5453 Circulation 1/2 hour, dolomite as above, anhydrite, limestone as above.

5453 Circulation 1 hour, dolomite, brownish gray, medium grained, fairly good intergranular porosity.

5453-5485 Dolomite as above.

5485-5500 Dolomite, brownish gray, fine to medium grained, slight porosity.

5500-5510 Dolomite, brownish gray, fine to medium grained, some fair porosity.

5510-5525 Dolomite, brownish gray, fine grained and microcrystalline, slight porosity, limestone, light gray, microcrystalline.

5525-5535 Limestone, light gray, fine grained, dolomite, brownish gray, fine grained.

5535-5545 Dolomite, brownish gray, fine to medium grained, limestone, light yellowish brown, fine grained, slight to fair porosity in dolomite.

5545-5555 Dolomite, light gray, microcrystalline, and as above.

5555-5585 Dolomite, yellowish gray, fine grained.

5585-5615 Limestone, yellowish gray, finely crystalline.

5615-5630 Limestone, medium light gray, microcrystalline.

5635-5650 Limestone, yellowish gray, fine grained.

5650-5665 Limestone, light gray, fine grained.

5665-5670 Dolomite, light grayish orange, fine grained, limestone as above.

5670-5685 Dolomite as above, shale, dark gray, anhydrite, white.

5685-5690 Circulation 1 1/3 hours, dolomite as above.

5690-5705 Dolomite, yellowish gray, fine grained, fair porosity.

5705-5715 Limestone, very light gray, fine grained.

5718 Circulation 1/2 hour, limestone as above.

5718 Circulation 1 hour, limestone as above.

5718-5755 Limestone, light yellowish gray, microcrystalline.

5760-5770 Limestone as above, anhydrite, white.

5774 Circulation 1/2 hour, anhydrite, white, crystalline.

5774 Circulation 3/4 hour, limestone, yellowish gray, fine grained. Anhydrite as above.

5774 Circulation 1 hour, limestone as above, little anhydrite.

5774 Circulation 1 1/4 hours, limestone as above, little anhydrite.

5774 Circulation 1 1/2 hours, limestone as above, dolomite, brownish gray, fine grained, anhydrite, white.

5774-5780 Limestone, light gray, microcrystalline, dolomite as above.

5780-5785 Anhydrite, yellowish gray, dense.

5790-5795 Limestone, brownish gray, fine grained, poor to fair porosity.
 5795-5805 Limestone, light gray, microcrystalline, some limestone as above.
 5805-5825 Dolomite, brownish gray, fine grained, slight porosity.
 5825-5830 Dolomite as above, anhydrite, pinkish gray.
 5831 Circulation 1/2 hour, dolomite, brownish gray, fine grained, to microsucrosic.
 5831 Circulation 1 hour, dolomite as above, anhydrite, white to pinkish gray.
 5831 Circulation 1 1/2 hours, dolomite, anhydrite as above, limestone, brownish gray, dense.
 5831-5845 Anhydrite, light gray, dense, dolomite, limestone as above, poor samples, shale, medium gray, free quartz grains.
 5845-5855 Dolomite, light brownish gray, microsucrosic, anhydrite, white to light gray, shale, medium gray.
 5855-5870 Dolomite, light brownish gray, fine grained, anhydrite, colorless, and as above.
 5870-5885 Dolomite as above, limestone, light gray, fine grained, earthy free, medium grained quartz, anhydrite as above.
 5885-5890 Limestone as above, dolomite as above.
 5890-5895 Limestone, brownish gray, dense, anhydrite, pinkish gray.
 5895-5900 Anhydrite as above.
 5900-5905 Dolomite, brownish gray, microsucrosic, fair porosity.
 5905-5945 Dolomite, light brownish gray, sucrosic, fair to good intergranular porosity.
 5945-5975 Dolomite, light brownish gray, fine grained, slight to fair porosity.
 5975-6015 Limestone, light gray, microcrystalline, dense.
 6015-6040 Limestone, light brownish gray, microcrystalline, dense.
 6040-6050 Limestone as above, dolomite, light brownish gray, fine grained.
 6050-6055 Limestone as above, dolomite as above, shale, dark gray.
 6055-6065 Dolomite, very pale orange, fine grained, dense, shale medium to dark gray, pyrite.
 6065-6070 Dolomite as above, also grayish red, fine grained, shale as above.
 6077 Circulation 1/2 hour, dolomite and shale as above.
 6077 Circulation 1 hour, dolomite, grayish red and pale red, fine grained, shale dark gray, light gray.
 6077 Circulation 1 1/4 hour, dolomite, shale as above.
 6077-6090 Dolomite as above, shale, dark gray, light gray, pyrite.
 6090-6095 Shale, light to dark gray, pyrite, dolomite as above.
 6095-6110 Shale, light gray, pyrite.
 6110-6120 Shale, dark gray, light gray, anhydrite, pinkish gray.
 6120-6125 Shale, dark gray, light gray, light greenish gray, 5G8/1.
 6125-6145 Dolomite, moderate reddish orange to grayish red 10R4/2, fine grained, some shale as above, anhydrite.
 6145-6160 Dolomite as above and very light gray, fine grained, some shale as above.
 6160-6200 Dolomite, very light gray, moderate reddish orange, fine grained, anhydrite, white to light gray, shale as above.
 6200-6220 Dolomite, light gray, fine grained, much anhydrite, light gray.
 6220-6250 Anhydrite, light gray, light brownish gray, dolomite as above.
 6250-6260 Shale, dark gray, light gray, anhydrite as above.
 6260-6290 Anhydrite as above, some shale, as above, dolomite, light brownish gray, fine grained.

6290-6335 Anhydrite as above, dolomite as above, and moderate reddish orange, fine grained.

6335-6360 Anhydrite, light gray, white, dolomite, moderate reddish orange, fine grain.

6360-6375 Dolomite, grayish orange pink, dense, anhydrite, white.

6375-6385 Dolomite, very pale orange, fine grained, limey, anhydrite.

6385-6440 Limestone, yellowish gray, fine grained, anhydrite.

6440-6455 Limestone, brownish gray, microcrystalline and fine grained.

6455-6470 Limestone, light gray, dense and as above.

6470-6505 Limestone, light gray, fine grained, dolomite, pale red, fine grained, anhydrite, white.

6505-6515 Limestone, very light gray, microcrystalline, some shale, dark gray.

6515-6540 Limestone as above, dense.

6540-6555 Limestone as above, some dolomite, pale orange, fine grained, limey.

6555-6590 Limestone, very light gray to white, sublithographic, dense.

6590-6600 Limestone as above, some dolomite, pale orange, fine grained, limey.

6604 Circulation 1/2 hour, limestone, dolomite as above.

6604 Circulation 1 hour, dolomite, limestone as above.

6604 Total Depth