

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 157

Summary of the Socony-Vacuum Oil Company - Angus Kennedy F-32-24-P Well  
Dunn County, North Dakota  
Well No. 607- Permit No. 621

By David S. Johnson  
February, 1957

Socony-Vacuum, Angus Kennedy, F-32-24-P, Dunn County, North Dakota, C SW NE Sec. 24, Twp. 149N., R. 93W. (Well site relocated to a point 130 ft. south and 50 ft. west of center of SW 1/4 NE 1/4 to avoid boggy conditions). Elevation 2136 G.L., 2145 K.B.

The Socony-Vacuum Angus Kennedy F-32-24-P was spudded June 5, 1954 and 13 3/8" casing was set at 492' with 400 sacks of cement. 7" casing was set at 9433' with 750 sacks of cement (protection string). Well was completed as a dry hole September 30, 1954, at a total depth of 11,331.

PLUGGING RECORD:

Hole filled with 10# per gallon mud; 7" casing, top at 4295', bottom cemented at 9450'; 5" O.D. liner, top at 8686', bottom cemented at 10,698'. Cement plug 11,331-10,700' with 130 sacks in 6 1/8" hole. Baker cement retainer in 5" O.D. casing at 10,515' with 7 sacks of cement squeezed through and 3 sacks left on top. Cement plug 4301'-4220' with 40 sacks to cover top of 7" casing stub at 4295'. Cement plug 500'-450' with 40 sacks across shoe of 13 3/8" casing at 492'. 10 sacks cement in top of 13 3/8" surface casing. Cut and recovered 4295' of 7" casing.

TESTS:

DST #1 10,530 - 10,712, open 3 1/2 hours, shut in 30 minutes, weak blow 10 minutes, recovered 630' fluid, 480' possible slight gas cut water cushion with small bubbles of rainbow oil, 60' gas cut muddy water, 90' very lightly oil and heavily gas cut mud, 1-2% oil, 84' fill up, 546' water cushion, flow pressure 500-560#, shut in pressure 650#, hydrostatic pressure not measured.

DST #2 10,850 - 11,061, open 3 1/2 hours, shut in 30 minutes, very weak blow, 780' water cushion, recovered 720' water cushion, lightly gas cut, 180' gas cut muddy water, 1950' gas cut salt water, flow pressure 625-1650#, shut in pressure 4700#, hydrostatic pressure 6525#.

DST #3 11,175-11,249, open 45 minutes, shut in 30 minutes, recovered 234' water cushion, 910' muddy water cushion, 1980' very slightly gas cut muddy salt water, 90' almost solid crystallized salt, flow pressure 975-1790#, shut in pressure 5390#, hydrostatic pressure 6900#.

Perforated 10,600-10,645 with 6 per foot and acidized with 1000, flow pressure 4125#. Flowed 15 barrels of lead water, flowed and swabbed 48 barrels fluid in 14 hours. Swabbed brownish oil with short gas blow, recovered acid and lead water.

Sandfract. Perforated 10,600 - 10,645. Flowed 25 barrels of lead oil, swabbed 70 barrels of lead oil. Retainer set at 10,592.

Perforated 10,540 - 10,570 with 6 per foot. Attempted to acidize, tubing blew out. Reperforated 10,540 - 10,567 with 2 per foot. Acidized perforations at 10,540, 10,567 with 5,000. Swabbed approximately 47 barrels of oil and acid water in 14 hrs.

Sandfract at 10,540 - 10,567, shut in 8 hours. Flowed displacement oil at 9 barrels per hour, 2 barrels per hour after 13 hours.

Reset packer at 10,509'. Flowed 3 barrels lead oil per hour, for 15 hours. Swabbed 31 barrels lead oil and new oil in 10 hours.

CORES:

7518- 34  
8927- 9492  
10318-11062  
11076-11331

Formation tops were picked from samples, radioactivity lateral and microlateral logs; not all formation tops called in the following list. Colors were picked from the rock color chart

	TOPS
Cretaceous System	
Pierre Formation	1800
Niobrara Formation	3757
Greenhorn Formation	4269
Dakota Group	4452
Fall River Formation	5047
Jurassic System	
Jurassic sand and shales	5428
Sundance Group	5551
Piper Limestone	6160
Triassic System	
Spearfish Formation	6345
Permian System	
Minnekahta Formation	6675
Opeche Formation	6760
Pennsylvanian System	
Minneluse Formation	7192
Mississippian System	
Amsden Formation	7320
Big Snowy Group	7689
Kibbey Lime	8165
Charles Formation	8316
"Base of Last Salt" (Mission Canyon)	8863
Lodgepole Formation	9666
Englewood Formation	10,510
Devonian System	
Lyleton Formption	10,606
Nisku Formation	10,845
Duperow Formation	10,943
Souris River	11,286

520-560 Lignite.  
 560-580 Limestone, medium light gray, argillaceous, fine-grained, dense.  
 580-600 Lignitic material  
 600-620 Limestone, medium light gray, argillaceous, fine-grained dense.  
 620-640 Lignitic material, some medium grained, smoky, quartz grains, subangular.  
 640-660 Limestone, medium gray, argillaceous, fine-grained, dense, some, lignite.  
 660-740 Lignitic material, has a slaty parting.  
 740-760 Lignite, contains fossil fragments.  
 760-800 Shale, pale reddish brown, limy, limestone, dusky brown, fossiliferous.  
 800-820 Limestone, light gray, argillaceous, fine-grained, fossil fragments.  
 820-840 Shale, light brown, calcareous, some lignite.  
 840-860 Lignitic material.  
 860-880 Lignite, some argillaceous limestone, very light gray, medium-grained.  
 880-920 Sandstone, browns and grays, friable, medium grain size, subangular occurs in nodules, calcareous cement.  
 920-960 Limestone, light gray, argillaceous, dense, contains fossil fragments.  
 960-980 Shale, light gray, lumpy, spongy, bentonitic.  
 1000-1060 Sandstone, light brownish gray, friable, medium grain size, subangular, slightly calcareous cement, some lignite.  
 1060-1120 Sandstone, light brown, medium-grained, subangular, shale, medium light gray, highly calcareous, fossiliferous.  
 1120-1140 Shale, grayish orange (10YR7/4) slightly calcareous.  
 1140-1160 Shale, light gray, calcareous, compact.  
 1160-1200 Sandstone, very light gray, fine grained, tight, very calcareous cement, micaceous.  
 1200-1220 Same as above, shale medium light gray, calcareous.  
 1220-1240 Shale, medium light gray, spongy, lumpy, bentonitic, sand grains, medium grained, subangular.  
 1240-1260 Sandstone, medium light gray, medium grained, subangular-angular. Shale as above.  
 1260-1280 Shale, medium light gray, bentonitic, calcareous.  
 1280-1300 Sandstone, very light gray, fine-grained, subangular, calcareous.  
 1300-1340 Shale, medium gray, bentonitic, lumpy, spongy, some lignite.  
 1340-1380 Sandstone, very light gray, fine-grained, calcareous, shale medium gray, compact, very calcareous, some lignite.  
 1380-1420 Lignite.  
 1420-1480 Sandstone, very light gray, medium grained, subangular, calcareous, friable.  
 1480-1540 Sandstone as above but silty, some lignite.  
 1540-1560 Shale, light gray, bentonitic, spongy, lumpy, sand grains, medium grained, subangular, lignite.  
 1560-1640 Shale, silty, medium light gray, bentonitic, spongy, sand grains.  
 1640-1660 Sandstone, shaly, light gray, medium-coarse grained, subangular.  
 1660-1680 Shale, medium light gray, bentonitic, lumpy. Sand grains.  
 1680-1700 Shale, light gray, silty, carbonaceous, bentonitic, lumpy.  
 1700-1800 Sandstone, light gray, medium grained, subangular, shaly, friable.  
 1800-1820 Shale, medium light gray, sandy.

1820-1900 Shale, medium light gray, lumpy, bentonitic, slightly calcareous.  
 1900-1920 Shale, as above, spongy, sand grains.  
 1920-1960 Shale, medium gray, lumpy, bentonitic, slightly calcareous.  
 1960-2020 Shale, medium light gray, silty, spongy, compact bentonitic.  
 2020-2040 Shale, medium light gray-medium gray, lumpy, fissile.  
 2040-2060 Shale, light gray-medium dark gray, fissile, compact, sand grains, medium grained.  
 2060-2100 Shale, as above, no sand grains.  
 2100-2140 Shale, medium gray, fissile, compact. Inoceramus fragments.  
 2140-2160 Shale, medium light gray, sandy, spongy, compact.  
 2160-2200 Shale, medium light gray, fissile, splintery. Inoceramus fragments.  
 2200-2240 Shale, medium light gray, silty, bentonitic, lumpy, some siltstone, pale red (10R6/2).  
 2240-2260 Shale, light gray-medium light gray, lumpy, micaceous, calcareous, some small calcite veins.  
 2260-2300 Shale, medium dark gray, medium light gray, bentonitic, flaky, white bentonite specks visible.  
 2300-2320 Shale, medium dark gray, very compact.  
 2320-2360 Shale, medium light gray, splintery to compact, small biotite crystals present, some bentonitic.  
 2360-2420 Shale, light gray, finely disseminated mica flakes, fissile, fossil fragments.  
 2420-2480 Shale, medium light gray, spongy, lumpy, bentonitic, white bentonite specks visible.  
 2480-2520 Shale, medium gray, spongy, bentonitic, inoceramus prisms present.  
 2520-2540 Shale, medium gray-medium light gray, bentonitic, spongy, fissile.  
 2540-2580 Shale, medium light gray, spongy, compact, fissile, bentonitic, inoceramus fragments.  
 2580-2600 Shale, medium gray, spongy, splintery, bentonitic, some grayish red, (5R4/2) shale.  
 2600-2620 Shale, light gray, fissile, slightly calcareous.  
 2620-2680 Shale, medium light gray, spongy, bentonitic, lumpy.  
 2680-2720 Shale as above. Some pale reddish brown (10R5/4) silty shale, some lignite. Some shale is compact.  
 2720-2800 Shale, medium light gray, fissile, some lignite, some moderate reddish orange (10R6/6) shale, inoceramus prisms.  
 2800-2820 Shale as above micaceous.  
 2820-2860 Shale, medium light gray, fissile, shale, silty, moderate reddish orange (10R6/6), fossiliferous, some bentonite present.  
 2860-2900 Shale, medium light gray, bentonitic, lumpy.  
 2900-2960 Shale, medium light gray-light gray, lumpy, fissile, some bentonite.  
 2960-3040 Shale, medium light gray, lumpy, bentonitic, inoceramus prisms.  
 3040-3120 Shale, medium light gray, lumpy, bentonitic, some medium gray, fissile, some lignite.  
 3120-3140 Shale, medium light gray, spongy, bentonitic, inoceramus prisms.  
 3140-3180 Shale, light brownish gray, silty, micaceous.  
 3180-3220 Shale, light gray-medium light gray, splintery, compact, fossil fragments.  
 3220-3280 Shale, as above, some lignitic material.  
 3280-3300 Shale, medium light gray, splintery, slightly calcareous.  
 3300-3320 Shale, as above, some micaceous bentonite.  
 3320-3360 Shale, medium light gray, lumpy, bentonitic.

3360-3400 Shale, medium light gray, fissile to splintery, mostly compact.

3400-3420 Shale, as above, also some light brown, 5YR6/4 shale, silty, some lignite.

3420-3440 Shale, medium light gray, splintery, lumpy, spongy, compact, some bentonitic, slightly calcareous.

3440-3500 Shale, as above, some shale, medium dark gray, fissile.

3500-3540 Shale, medium light gray, lumpy, spongy, bentonitic.

3540-3580 Shale as above, inoceramus fragments, some lignite.

3580-3620 Shale, medium dark gray, platy, also some as above.

3620-3660 Shale, medium gray-medium dark gray, lumpy to fissile, spongy to compact.

3660-3680 Shale, light gray, lumpy, slightly calcareous, bentonitic.

3680-3760 Shale as above, some medium gray shale, compact.

3760-3780 Shale, medium gray, compact, some is splintery.

3780-3820 Shale, medium gray, compact, calcareous white specks.

3820-3860 Shale, medium gray-medium dark gray, lumpy to compact, some bentonitic, some white calcareous specks.

3860-3920 Shale, medium light gray, splintery, compact fossil fragments, some loose bentonite, some medium gray, white specks.

3920-3940 Shale, as above, some lignitic material.

3940-3980 Shale, medium light gray, lumpy, bentonitic, shale, medium dark gray, splintery.

3980-4000 Shale, medium light gray, splintery, compact, some dark gray shale.

4000-4020 Shale as above, some white specks.

4020-4040 Shale, light gray, platy, splintery, bentonite flakes.

4040-4080 Shale, medium light gray, compact, splintery.

4080-4120 Shale, light gray, slightly bentonitic.

4120-4140 Shale, medium light gray, splintery, slightly calcareous.

4140-4180 Shale, medium dark gray, compact, shale, pale yellowish brown (10YR6/2) compact. Also traces of dark reddish brown (10R3/4) siltstone. A poor sample.

4180-4220 Shale, medium light gray, soft, platy, some is splintery, inoceramus prisms.

4220-4230 Shale, medium light gray, medium hard, platy. Also some dark gray shale with white specks.

4230-4250 Shale, as above, some very light gray siltstone, medium dark gray shale with white specks.

4250-4260 Shale, medium light gray-medium dark gray, soft to compact, poor sample.

4260-4280 Shale, medium light gray, lumpy, silty, bentonitic, micaceous, inoceramus prisms.

4280-4300 Shale, medium dark gray, platy, white specks. Siltstone pale yellowish brown (10YR6/2), micaceous.

4300-4310 Shale, light gray, splintery-fissile, also shale and siltstone as above, probably caving.

4310-4340 Shale, medium gray, compact, white calcareous specks, sample contains a lot of caving material, some medium light gray shale, calcareous.

4340-4360 Shale, medium gray, highly calcareous, compact, inoceramus prisms, white specks.

4360-4370 Limestone, medium light gray, argillaceous, cryptocrystalline.

4370-4380 Shale, medium gray, soft, fissile, limy.

4380-4410 Shale, medium dark gray, platy, disaggregated, white specks, some medium light gray, bentonitic shale.

4410-4420 Sample missing.

4420-4430 Shale, medium gray, platy, white specks, inoceramus fragments.

4430-4450 Shale, medium gray, platy, siltstone, pale brown 5YR5/2, compact, inoceramus fragments.

4450-4460 Shale, as above, shale medium light gray, lumpy, bentonitic, calcareous.

4460-4480 Shale, medium light gray, fissile, lumpy, some bentonitic, calcareous, siltstone, pale yellowish brown (10YR6/2).

4480-4500 Shale, medium light gray, platy, shale, medium gray, white specks, presumably because of a sample log.

4500-4510 Shale, medium light gray, platy, some is silty, sample is mixed.

4510-4520 Shale as above, siltstone, pale yellowish brown (10YR6/2) calcareous, some iron stain on part of sample.

4520-4530 Shale, medium dark gray, platy, calcareous, siltstone, as above.

4530-4540 Shale, grayish black, fissile, medium hardness, inoceramus prisms.

4540-4560 Shale, as above, shale, medium light gray, fissile, calcareous.

4560-4570 Shale, medium dark gray, fissile to splintery.

4570-4590 Shale, as above, some calcite veins, shale medium gray, compact, inoceramus fragments.

4590-4610 Shale, medium dark gray, splintery, siltstone, light olive gray.

4610-4620 Shale, as above, shale, medium light gray, compact, calcareous, inoceramus prisms.

4620-4630 Shale, medium dark gray, fissile, splintery.

4630-4650 Shale, as above, some shale, medium gray, splintery.

4650-4670 Sample, as above, siltstone, light brown (5YR6/4), very slightly calcareous.

4670-4690 Shale, medium dark gray, fissile, to splintery.

4690-4720 Shale, as above, shale, light brown (5YR6/4), silty, compact. Slightly calcareous and bentonitic.

4720-4740 Shale, medium gray, splintery, shale, medium light gray, fissile to splintery, calcareous, micaceous, finely disseminated.

4740-4750 Shale, medium dark gray-medium gray, fissile, compact, some siltstone, light brown (5YR6/4).

4750-4760 Shale, medium dark gray, splintery, lignitic material, white bentonite particles.

4760-4770 Shale, medium dark gray, splintery, siltstone, light olive gray, 5Y6/1, calcareous.

4770-4780 Shale, medium gray, fissile, shale, greenish gray, very calcareous, compact, inoceramus fragments.

4780-4800 Shale, medium dark gray, fissile, siltstone, pale brown, 5YR5/2, slightly carbonaceous.

4800-4820 Shale, as above, shale, medium light gray, hard, compact, very calcareous, white calcareous nodules.

4820-4840 Shale, light brownish gray, 5YR6/1, lumpy, bentonitic, very slightly calcareous, shale, as above.

4840-4850 Shale, medium gray, slightly calcareous, platy, splintery, shale, dark gray, splintery.

4850-4870 Shale, medium dark gray, splintery, some fissile shale, medium light gray, flaky.

4870-4900 Shale, medium gray, platy, some is splintery and micaceous. Shale, medium light gray, soft, inoceramus fragments. Poor grade lignite.

4900-4910 Shale, medium gray, splintery.

4910-4920 Shale as above, sandstone, dark yellowish brown (10YR4/2). Some flakes of bentonite visible.

4920-4940 Shale, medium gray, fissile, very fine-grained, disseminated mica.

4940-4960 Shale, as above, shale, medium dark gray, platy, compact.

4960-4980 Shale, medium light gray, platy, calcareous.

4980-4990 Shale, medium dark gray, fissile, also shale as above, siltstone, sandy, light brown (5YR6/4), calcareous.

4990-5010 Shale, medium dark gray, splintery, sample is very contaminated.

5010-5030 Samples missing.

5030-5040 Shale, medium dark gray, splintery, sandstone, vitreous, medium-coarse grained, grains are subangular, rounded.

5040-5050 Shale, medium dark gray, splintery, compact, platy.

5050-5060 Shale, medium gray, compact, sandstone, silty, very light gray, fine-grained.

5060-5070 Siltstone, pale yellowish brown (10YR6/2), shale, medium light gray, splintery.

5070-5080 Siltstone, very light gray, sandy.

5080-5100 Sandstone, silty, very light gray, fine-grained, grains are frosted to vitreous, grains are subangular, sample contains a lot of shale cavings.

5100-5120 Sandstone, very light gray, medium grain size, subangular, much shale cavings.

5120-5130 Siltstone, light gray, slightly calcareous.

5130-5140 Shale, medium light gray, soft, platy.

5140-5160 Sandstone, vitreous, medium grain size, subangular to rounded, siltstone, light brownish gray, (5YR6/1).

5160-5170 Sandstone, very light, gray, fine grained, well cemented, shale, medium grained, splintery.

5170-5180 Shale, medium dark gray, platy, splintery.

5180-5190 Shale, medium dark gray, fissile, some medium light gray, compact.

5190-5220 Shale, medium gray, soft, fissile, splintery.

5220-5250 Shale, medium dark gray, splintery, some shale, medium gray, very soft, fissile, bentonitic.

5250-5270 Shale, as above, sandstone, white, fine grained, sample is very contaminated, inoceramus prisms.

5270-5290 Shale, medium gray, platy, sandstone, white to very light gray, fine-grained, well indurated, calcareous cement, pyrite.

5290-5310 Sandstone, white to very light gray, fine grained, calcareous cement, a few siderite nodules.

5310-5320 Sandstone, as above, siltstone, pale yellowish brown (10YR6/2).

5320-5330 Shale, medium dark gray, splintery, siltstone and sandstone as above.

5330-5350 Shale, medium light gray, soft, fissile, shale, medium gray, splintery, some bentonite, pyrite.

5350-5370 Shale, as above, pyrite, sample is contaminated.

5370-5380 Shale as above, sandstone, vitreous, frosted, medium grain size.

5380-5390 Shale, medium dark gray, platy, splintery, unsorted sand grains, fine to medium grain, vitreous.

5390-5410 Shale, medium gray, medium dark gray, some sandstone, coarse grained, subangular, frosted, milky appearance.

5410-5430 Sandstone, very light gray, fine grained aggregates, some coarse quartz grains, subangular.

5430-5440 Sandstone, as above, shale, medium dark gray, splintery, compact.

5440-5460 Shale, medium dark gray, splintery, platy, micaceous, siltstone, pale brown, (5YR5/2).

5460-5480 Shale as above, siltstone, very light gray, slightly calcareous.

5480-5490 Shale, medium dark gray, splintery, compact.

5490-5500 Shale, medium gray, splintery, compact, siltstone, very light gray, calcareous.

5500-5520 Shale, as above, some shale is very soft, fissile.

5520-5540 Shale, as above, some very light gray siltstone.

5540-5550 Sandstone, very light gray, fine grained, tight, well cemented, calcareous.

5550-5570 Sandstone, as above, shale, medium dark gray, splintery, pyrite.

5570-5590 Siltstone, light gray, calcareous.

5590-5600 Siltstone, as above, shale, medium gray, soft, platy, much caving in sample.

5600-5610 Shale, medium light gray, silty, lumpy, some light gray siltstone.

5610-5620 Sandstone, silty, very light gray, fine grained, calcareous, micaceous, tight.

5620-5630 Sandstone, as above, slate, greenish gray, (5GY6/1) waxy, slaty, shales are interbedded.

5630-5650 Shale, medium dark gray, soft, slaty, also sandstone as above.

5650-5670 Siltstone, light gray, calcareous, well cemented, shale, greenish gray, (5GY6/1), waxy, flaky.

5670-5680 Shale, medium dark gray, platy, flaky, some siltstone as above.

5680-5700 Sandstone, silty, very light gray, tight, well cemented, calcareous, shale as above.

5700-5710 Limestone, sandy, very light gray, fine-medium grain size.

5710-5720 Sandstone, very light, very fine grained, calcareous, firmly cemented.

5720-5730 Siltstone, sandy, light gray, calcareous, shale, medium gray, splintery, platy.

5730-5740 Sandstone, very light gray, fine grained, calcareous, well cemented, shale, as above.

5740-5760 Sandstone, as above.

5760-5770 Sandstone, as above, shale, silty, greenish gray (5GY6/1), micaceous, slightly, calcareous.

5770-5790 Shale, as above, shale, medium dark gray, splintery, compact, much caving.

5790-5310 Shale, greenish gray (5GY6/1) splintery, soft, slaty, calcareous, some medium dark gray shale, splintery.

5810-5860 Shale, greenish gray (5GY6/1) soft, platy, waxy, calcareous, shale, grayish red (5R4/2).

5860-5870 Shale, greenish gray (5GY6/1) soft, platy, waxy, calcareous, limestone, dusky red (6R3/4) very fine grained, banding.

5870-5900 Shale as above, also shale, grayish red, papery, calcareous, waxy.

5900-5920 Samples missing.

5920-5930 Shale, greenish gray, (5GY6/1) flaky, siltstone, very light gray, sandy, calcareous.

5930-5940 Shale, as above, but splintery, shale, medium light gray, compact, very calcareous.

5940-5950 Sandstone, greenish gray, conglomeratic, soft cement is bentonitic, sand grains are moderate brown with a vitreous appearance.

5950-5960 Limestone, medium light gray, argillaceous, compact.

5960-5980 Limestone, as above, greenish gray sandstone as above, possibly glauconite.

5980-5990 Siltstone, light brownish gray, (5YR6/1) very limy, lumpy.

5990-6000 Siltstone as above, siltstone grayish red (5R4/2), calcareous.

6000-6010 Siltstone as above, shale, medium dark gray, soft flaky, some is splintery.

6010-6030 Shale, greenish gray, (5GY6/1) flaky, siltstone as above.

6030-6040 Shale, as above, limestone, very light gray, lithographic, argillaceous.

6040-6050 Shale, medium dark gray, greenish gray (5GY6/1) splintery, slightly calcareous.

6050-6060 Shale, varicolored, flaky, splintery, slaty, compact.

6060-6080 Samples missing.

6080-6090 Limestone, medium light gray, silty, fine grained.

6090-6100 Shale, medium dark gray, splintery, shale, greenish gray, flaky, calcareous.

6100-6120 Shale, medium gray, splintery, compact, shale, light gray, very limy.

6120-6130 Siltstone, grayish red, (10R4/2) also light gray, limy shale, lumpy.

6130-6160 Limestone, very light gray, very fine grained, sublithographic dolomite rhombs included in the limestone.

6160-6170 Limestone, light brownish gray, very fine grained.

6170-6190 Limestone, very light gray, white, very fine grained to sublithographic, interbedded, medium gray shales interbedded, splintery, calcareous.

6190-6230 Samples missing.

6230-6260 Shale, medium light gray, platy, micaceous, limestone, as above, much caving material.

6260-6290 Limestone, white, very light gray, sublithographic, much caving, some shale, dark greenish gray (5GY4/1), silty, calcareous.

6290-6320 Limestone, light brownish gray, sublithographic, some greenish gray, shale (5GY6/1) calcareous, compact, some anhydrite.

6320-6340 Shale, medium light gray, sandy, lumpy, some limestone, as above, probably caving.

6340-6350 Limestone, yellowish gray (5Y8/1) sublithographic anhydrite.

6350-6370 Siltstone, pale reddish brown (10R5/4), some grayish orange pink, (10R8/2) anhydrite.

6370-6390 Shale, grayish red (10R4/2) lumpy, silty, anhydrite.

6390-6410 Siltstone, pale reddish brown (10R5/4) slightly calcareous, anhydrite, cavings, salt, from microlateral log.

6410-6440 Siltstone, as above, but with enclosed quartz grains, fine grained, anhydrite cavings, salt from microlateral log.

6440-6460 Siltstone, pale reddish brown, (10R5/4), calcareous, gypsum, vitreous, fine grain, angular.

6460-6490 Siltstone as above, also siltstone, grayish red (5R4/2) very compact, some gypsum.

6490-6510 Siltstone, shaly, grayish red (10R4/2) much caving material.

6510-6550 Siltstone, moderate reddish orange (10R6/6), some gypsum, also anhydrite which may be cavings.

6550-6620 Siltstone, same as above, some shale, silty, grayish red (10R4/2).

6620-6680 Shale, medium gray, splintery, compact, calcareous, some siltstone as above. The gray shale is probably cavings.

6680-6710 Limestone, pinkish gray (5YR8/1) fine grained, dolomitic, siltstone, as above.

6710-6740 Limestone, yellowish gray, (5Y8/1) dolomitic, sublithographic.

6740-6760 Limestone, pinkish gray, dolomitic, sublithographic, much reddish siltstone caving.

6760-6780 Shale, moderate reddish orange (10R6/6) silty, partly dolomitic, some gypsum specks.

6780-6820 Siltstone, moderate reddish orange, partly dolomitic some anhydrite.

6820-6910 Salt, samples are all caving material. Salt picked from log, they must have changed to salt base mud.

6910-6940 Siltstone, pale reddish brown (10R5/4).

6940-7010 Shale, moderate reddish orange (10R6/6) calcareous.

7010-7030 Siltstone as above, sample is mostly caving.

7030-7120 Shale as above, siltstone, moderate reddish brown, dolomitic, samples are mostly caving, some anhydrite.

7120-7150 Shale, moderate reddish orange, calcareous, very poor samples through Opeche section.

7150-7190 Salt, siltstone and shale as above.

7190-7210 Dolomite, grayish orange pink, (5YR7/2) medium grain size, interbedded with greenish gray shale.

7210-7220 Sandstone, moderate pink, (5R7/4) fine grained, subround medium cementation, slightly dolomitic.

7220-7240 Dolomite, pale red (10R6/2) crystalline, some sandstone as above, some gypsum.

7240-7295 Samples missing.

7295-7300 Dolomite, pale red (10R6/2) granular, sandstone, grayish pink, poor sorting, dolomitic,

7300-7310 Sandstone, grayish pink, poor sorting, subround, dolomitic, has some porosity.

7310-7320 Dolomite, pale red (10R6/2) crystalline.

7320-7335 Sandstone, moderate orange pink, friable, slightly dolomitic, fine to medium grained, subround-round.

7335-7340 Sandstone, as above, dolomite, pale red (10R6/2) crystalline.

7340-7350 Dolomite, moderate pink (5R7/4) sandy, granular.

7350-7360 Shale, medium light gray, slightly dolomitic, some medium gray shale, splintery.

7360-7370 Shale, as above, sandy dolomitic, pale red, crystalline.

7370-7330 Shale, medium dark gray, platy, slaty, dolomite as above, probably caving.

7380-7395 Sandstone, moderate pink (5R7/4) very tight, fine grained, well cemented, shale, as above, sandstone is slightly dolomitic.

7395-7400 Sandstone, grayish orange pink (10R8/2) fine grained, well cemented, slightly dolomitic.

7400-7410 Sandstone, as above, some crystalline dolomite, grayish pink (5R8/2), some mica flakes, interbedded shales.

7410-7420 Sandstone, dolomitic grayish orange pink, pale red, (10R6/2), very fine grained, cherty, mica flakes.

7420-7425 Sandstone, as above.

7425-7435 Dolomite, pinkish gray (5YR8/1) fine grained, some anhydrite, white.

7435-7440 Dolomite, as above, sandy.

7440-7445 Shale, medium light gray, compact, dolomite, as above.

7445-7460 Sandstone, pale red, (10R6/2) very fine grained, dolomitic, much caving.

7460-7465 Sample missing.

7465-7470 Shale, medium light gray, flaky, compact.

7470-7480 Dolomite, pinkish gray, sandy, granular, cherty, some anhydrite, white, granular.

7480-7490 Shale, greenish gray, platy, dolomitic, some mica flakes.

7490-7495 Sandstone, pale red (10R6/2) fine grained, dolomitic.

7495-7510 Shale, greenish gray, (5GY6/1), dolomitic, slaty.

7510-7515 Sandstone, pale red, (10R6/2) poorly sorted, dolomitic.

7515-7520 Shale, medium light gray, platy, dolomitic.

7520-7530 Samples missing.

7530-7535 Sandstone, grayish pink (5R8/2) fine grained, dolomitic.

7535-7540 Shale, medium light gray, platy, sandstone, as above.

7540-7545 Shale, medium light gray, platy, slightly dolomitic.

7545-7560 Sandstone, pinkish gray, (5YR8/1) dolomitic, fine grained, shale cavings.

7560-7570 Shale, greenish gray, platy, dolomitic, much caving, some dolomite, grayish pink (5R8/2).

7570-7575 Dolomite, moderate reddish brown (10R4/6), shaly.

7575-7595 Dolomite, pale reddish brogan (10R5/4), granular, shale, moderate reddish brown (10R4/6).

7595-7605 Dolomite, pale red (10R6/2) granular, tight, also dolomite, grayish pink (5R8/2).

7605-7620 Dolomite, pale red (10R6/2), some is sandy.

7620-7625 Dolomite, grayish pink (5R8/2), some grayish pink, (5R8/2) fine grained sandstone.

7625-7630 Shale, medium gray, platy, sandstone, dolomite, as above.

7630-7650 Dolomite, grayish pink (5R8/2) granular.

7650-7660 Dolomite, pale red (10R6/2) some grayish pink (5R8/2) sandy.

7660-7665 Shale, moderate red (5R5/4) compact, dolomitic. Dolomite, as above.

7665-7675 Dolomite, grayish orange pink (10R8/2) some anhydrite chips.

7675-7690 Dolomite, as above, shale, medium gray, platy.

7690-7705 Shale, medium gray, splintery, slaty, much caving, some limestone, light brownish gray.

7705-7725 Shale, medium dark gray, splintery, samples are very poor.

7725-7740 Shale, variegated, splintery, massive, compact.

7740-7770 Shale, medium gray, splintery, platy, some variegated shales, compact, some calcarenite, pinkish gray (5YR8/1).

7770-7785 Shale, variegated, mostly grayish red, (5R4/2) some limestone, pale red (10R6/2).

7785-7790 Shale, grayish red (5R4/2) lumpy, dolomitic,

7790-7800 Shale, varigated, as above, splintery to platy.

7800-7820 Shale, grayish red (10R4/2) platy, compact, some shale is dolomitic.

7820-7825 Shale, variegated, massive, some is dolomitic, some medium dark gray shale.

7825-7850 Shale, grayish black, slaty, compact, some variegated shale.

7850-7875 Shale, variegated, platy, some shale is grayish olive (10Y4/2) some shale is dolomitic.

7875-7880 Shale, medium dark gray, splintery, dolomitic.

7880-7900 Shale, medium gray, splintery, some limestone, light gray, finely crystalline, some variegated shale.

7900-7915 Shale, greenish gray (5GY6/1), medium gray, platy.

7915-7970 Shale, variegated, some sandy limestone, yellowish gray (5GY8/1).

7970-7995 Samples missing.

7995-8000 Shale, medium dark gray, splintery, brittle, some very fine grained sandstone, pinkish gray (5YR8/1).

8000-8010 Sandstone, as above, some sandstone is pale red (10R6/2), slightly dolomite.

8010-8030 Sandstone, as above, interbedded variegated shales, some mica flakes.

8030-8065 Sandstone, pinkish gray (5YR8/1) fine grained, rest of sample as above, small amounts of gypsum.

8065-8070 Sandstone as above, medium gray shale predominates, platy to splintery, some variegated shales.

8070-8100 Sandstone as above, some is dusky red (5R3/4), interbedded variegated shales.

8100-8120 Samples missing.

8120-8170 Sandstone, white-reds, very fine grained, fine grained, variegated shales, some limestone chips, grayish, orange pink (10R8/2).

8170-8180 Limestone, very light gray-white, sublithographic, tight, sample consists of mostly cavings.

8180-8185 Sample missing.

8185-8230 Limestone, as above, some limestone is yellowish-gray (5Y8/1) interbedded.

8230-8265 Limestone, medium, light gray, sublithographic, samples through Kibbey limestone section are very poor.

8265-8320 Limestone, light brownish gray, finely crystalline, also limestone as above, some white anhydrite.

8320-8435 Salt, picked from logs. Samples consist of caving material.

8435-8450 Limestone, light brownish gray (5YR6/1) shale, variegated, splintery, some anhydrite chips.

8450-8480 Salt, picked from logs, samples consist of caving material.

8480-8495 Shale, variegated, compact, silty, some dusky red (5R3/4) siltstone.

8495-8530 Salt, picked from logs, samples consist of caving material.

8530-8570 Shale, medium dark gray-light gray, some variegated and silty, splintery, sandstone, light brown (5YR6/4) medium-fine grained, limestone, white, tight.

8570-8620 Salt, picked from logs, samples consist of caving material.

8620-8645 Shale, variegated, splintery, anhydrite, white, some brownish limestone.

8645-8705 Limestone, pale yellowish brown (10YR6/2) with interbedded shales, variegated some limestone, white sublithographic.

8705-8715 Salt picked from logs, samples consist of caving material.

8715-8730 Shale, variegated, limestone, white, sublithographic, moderate red (5R5/4).

8730-8775 Limestone, white, sublithographic, shale, as above, mica flakes interbedded with predominance of shale and limestone alternating.

8775-8830 Anhydrite, white, shale, limestone as above.

8830-8865 Salt, picked from logs, samples are caving material.

8865-8890 Shale, variegated, some limestone, grayish white, sublithographic.

CORE CHIPS DESCRIPTION:

8927-8930 Anhydrite, medium light gray, dolomite, very light gray, fine grained.

8930-8933 Limestone, brownish gray (5YR4/1) finely crystalline, contains some siderite crystals.

8933-8939 Limestone, grayish brown (5YR3/2).

8939-8942 Limestone, brownish gray, (5YR4/1) crystalline.

8942-8945 Limestone, grayish brown, (5YR3/2) crystalline.

8945-8948 Limestone, very light gray, anhydrite, brownish gray (5YR4/2).  
 8948-8967 Anhydrite, brownish gray (5YR4/1) medium dark gray.  
 8967-8970 Limestone, pale yellowish brown (10YR6/2) with veinlets of grayish brown dolomite (5YR3/2), limestone, brownish gray, (5YR4/1).  
 8970-8973 Limestone, pale yellowish brown (10YR6/2), as above.  
 8973-8976 Dolomite, pinkish gray, (5YR8/1), very light gray, sublithographic shale, medium dark gray, compact.  
 8976-8979 Limestone, yellowish gray, (5Y8/1) sublithographic, anhydrite, pale yellowish brown (10YR6/2).  
 8979-8982 Limestone, grayish brown, (5YR3/2) dolomitic, crystalline, anhydrite, very light gray, some yellowish gray dolomitic included.  
 8982-8985 Dolomite, pinkish gray (5YR8/1) sublithographic, shows banding.  
 8985-8987 Dolomite, as above with bands of medium light gray, anhydrite.  
 8987-8990 Limestone, brownish gray (5YR4/1) crystalline, medium grained.  
 8990-8993 Limestone, as above, with some white anhydrite.  
 8993-8996 Limestone, as above, dolomite rhombs, brownish black (5YR2/1).  
 8996-8999 Limestone, very light gray, crystalline, partly dolomitic.  
 8999-9002 Limestone, light brownish gray, medium grained.  
 9002-9005 Limestone, very light gray, fine grained, oil specks.  
 9005-9008 Limestone as above, limestone, dusky yellowish brown (10YR2/2) crystalline.  
 9008-9011 Limestone, medium light gray, fine grained, limestone, light brownish gray (5YR6/1) very fine grained.  
 9011-9014 Limestone, medium gray, crystalline.  
 9014-9017 Limestone, medium light gray, dolomitic, fossiliferous, very fine grained.  
 9017-9020 Dolomite, medium dark gray, fine grained, limy.  
 9020-9023 Dolomite, light gray, inclusions of anhydrite, shows porosity.  
 9023-9029 Dolomite, as above, oil stained.  
 9029-9032 Limestone, light gray, somewhat dolomitic, tight.  
 9032-9038 Limestone, medium gray, fine grained, crystalline, tight.  
 9038-9041 Dolomite, very light gray, contains anhydrite, white, intermixed.  
 9041-9044 Limestone, medium gray, fine grained, dolomite rhombs, brownish gray (5YR4/1).  
 9044-9047 Dolomite, light gray, porosity, shows banding.  
 9047-9050 Dolomite, limy, light brownish gray (5YR6/1), tight.  
 9050-9056 Limestone, brownish gray (5YR4/1), tight.  
 9056-9059 Limestone, light brownish gray dolomite rhombs, brownish gray (5YR4/1).  
 9059-9062 Dolomite, pale yellowish brown (10YR6/2) slight porosity.  
 9062-9068 Anhydrite, medium dark gray.  
 9068-9071 Dolomite, medium light gray, shows banding.  
 9071-9074 Anhydrite, light brownish gray, (5YR6/1), medium dark gray.  
 9074-9077 Anhydrite, medium dark gray.  
 9077-9080 Dolomite, light gray, dense.  
 9080-9083 Limestone, medium light gray, secondary dolomite rhombs.  
 9083-9086 Limestone, pale yellowish brown, (10YR6/2), fine grained.  
 9086-9089 Limestone, medium light gray, dense.  
 9089-9098 Limestone, medium light gray, oolitic, porosity.  
 9098-9101 Limestone, medium gray, oolitic, dense.  
 9101-9104 Limestone, medium dark gray, dense, limestone, medium light gray, fine grained.  
 9104-9107 Dolomite, very light gray, slight porosity.

9107-9110 Dolomite, light gray, secondary dolomite crystals, some oolites.  
 9111-9114 Limestone, medium grained, dense.  
 9114-9120 Limestone, medium light gray, oolitic.  
 9120-9123 Limestone, brownish gray, (5YR4/1) dense.  
 9123-9129 Limestone, light gray, secondary calcite crystals, fossiliferous.  
 9129-9132 Limestone, medium gray-brownish gray (5YR4/1), dense.  
 9132-9135 Limestone, medium light gray, secondary calcite, dense.  
 9135-9138 Limestone, light gray, oolitic, secondary calcite.  
 9138-9141 Limestone, pale brown (5YR5/2), slight vuggy porosity.  
 9141-9144 Limestone, medium light gray, dense.  
 9144-9147 Limestone, light gray, oolites, secondary calcite.  
 9147-9150 Limestone, medium light gray, dense, fossiliferous.  
 9150-9153 Limestone, medium light gray, oolitic.  
 9153-9155 Limestone, light gray, secondary calcite.  
 9155-9161 Limestone, medium light gray, oolites, tight.  
 9161-9164 Limestone, light gray, fossiliferous.  
 9164-9166 Limestone, medium light gray, hard, crystalline.  
 9166-9172 Limestone, medium light gray, oolitic.  
 9172-9175 Limestone, grayish brown, (5YR3/2) oolitic, secondary calcite fillings, limestone, medium light gray, oolitic, stylolites.  
 9175-9178 Limestone, medium light gray, oolitic, secondary calcite fillings.  
 9178-9181 Limestone, light olive gray, oolitic, hard, fractures filled with secondary calcite.  
 9181-9184 Limestone, light gray, partly oolitic, tight.  
 9184-9187 Limestone, pale yellowish brown, hard crystalline, secondary calcite, stylolites.  
 9187-9196 Limestone, light gray, secondary calcite fillings, tight.  
 9196-9199 Limestone, medium light gray, crystalline.  
 9199-9202 Limestone, medium gray, very fine grained, hard, anhydrite, white.  
 9202-9205 Limestone, brownish gray, (5YR4/1) some fractures filled with secondary calcite, hard.  
 9205-9208 Limestone, medium gray, hard, crystalline.  
 9208-9214 Limestone, medium light gray, hard, secondary calcite.  
 9214-9217 Limestone, medium light gray, oolitic.  
 9217-9223 Limestone, medium gray, oolitic, recrystallized, dense.  
 9223-9232 Limestone, medium light gray, oolitic.  
 9232-9235 Limestone, brownish gray, recrystallized, oolites.  
 9235-9238 Limestone, light olive gray (5Y6/1) recrystallized oolites, secondary calcite.  
 9238-9241 Limestone, medium light gray, recrystallized.  
 9241-9244 Limestone, medium gray, dense.  
 9244-9247 Limestone, medium light gray, oolites, anhydrite, white.  
 9247-9250 Anhydrous limestone, light brownish gray (5YR6/1).  
 9250-9253 Anhydrite, medium gray.  
 9253-9256 Anhydrite, light gray, shaly.  
 9256-9259 Limestone, medium light gray, dense.  
 9259-9268 Anhydrite, very light gray, shale, light gray, calcareous.  
 9268-9271 Limestone, medium gray, dense.  
 9271-9274 Limestone, light gray, hard, crystalline.  
 9274-9277 Limestone, medium gray, fractured, fine grained, very slight show.  
 9277-9280 Limestone, medium light gray, fragmental.  
 9280-9283 Limestone, medium dark gray, very hard, dense.  
 9283-9292 Limestone, medium light gray, recrystallized.  
 9292-9295 Limestone, medium gray, fine grained, dense.

9295-9298 Limestone, medium light gray, recrystallized.  
 9298-9307 Limestone, light brownish gray (5YR6/1) recrystallized.  
 9307-9313 Limestone, light olive gray (5Y6/1) medium grained.  
 9313-9316 Limestone, medium gray, partly crystalline, dense.  
 9316-9319 Limestone, light brownish gray, crystalline.  
 9319-9325 Limestone, brownish gray, crystalline.  
 9325-9331 Limestone, medium dark gray, dense.  
 9331-9334 Limestone, medium dark gray, secondary calcite crystals.  
 9334-9337 Limestone, medium gray, partly crystalline.  
 9337-9343 Limestone, medium dark gray, very dense, irregular banding, secondary calcite crystals.  
 9343-9346 Shale, dark gray, compact, partly calcareous.  
 9346-9349 Limestone, medium dark gray, partly crystalline, medium grained, contains shale fragments.  
 9349-9352 Limestone, medium dark brownish gray, dense.  
 9352-9355 Shale, medium dark gray, intermixed with limestone, shale is calcareous, compact.  
 9355-9358 Limestone, medium dark gray, fine grained, dense, partly crystalline.  
 9358-9361 Limestone, medium gray, shaly, contains large calcite crystals.  
 9361-9364 Limestone, brownish gray, partly crystalline.  
 9364-9367 Limestone, light brownish gray, partly crystalline.  
 9367-9373 Dolomite, light brownish gray, contains crystals of calcite.  
 9373-9376 Limestone, medium light gray, partly crystalline.  
 9376-9379 Limestone, medium gray, recrystallized.  
 9379-9382 Limestone, brownish gray, contains vein fillings of anhydrite crystals.  
 9382-9385 Limestone, brownish gray, partly recrystallized, some crystals of calcite.  
 9385-9391 Limestone, light brownish gray, partly crystalline.  
 9391-9394 Limestone, medium Gray, medium grained crystalline.  
 9394-9398 Limestone, brownish gray, light brownish gray, irregularly fractured.  
 9398-9401 Limestone, light gray, partly crystalline, irregularly fractured.  
 9401-9404 Limestone, light brownish gray, fine grained, chert, light gray.  
 9404-9407 Limestone, light gray, very fine grained, limestone white, somewhat sandy, fine grained, soft.  
 9407-9413 Limestone, medium light gray, partly crystalline, fossiliferous.  
 9413-9416 Limestone, light brownish gray, partly crystalline.  
 9416-9419 Limestone, intermingled, white-brownish gray, the white is rather sandy and dolomitic.  
 9419-9422 Limestone, medium gray, fine grained, partly crystalline, fossiliferous.  
 9422-9425 Limestone, very light gray, stylolites.  
 9425-9428 Same as sample 9419-9422.  
 9428-9445 Limestone, light brownish gray, fine grained-coarse crystalline, fossiliferous.

End of Cores

9445-9450 Sample missing.  
 9450-9460 Limestone, light gray, fine grained, some gray chert.  
 9460-9475 Limestone, medium light gray, fine grained to crystalline.  
 9475-9490 Limestone, medium gray, crystalline, dense.  
 9490-9500 Limestone, as above, some light brownish gray limestone.

9500-9515 Limestone, medium gray, shaly, dense.  
 9515-9520 Limestone, light gray, dense, tight.  
 9520-9525 Samples missing.  
 9525-9530 Limestone, medium gray, dense.  
 9530-9545 Limestone, light brownish gray, partly crystalline, some limestone, white, crystalline.  
 9545-9555 Limestone, light gray-brownish gray, tight.  
 9555-9570 Limestone, brownish gray-light brownish gray, dense, partly crystalline.  
 9570-9585 Limestone, light gray-brownish gray, crystalline.  
 9585-9595 Limestone, very light gray, tight.  
 9595-9605 Samples missing.  
 9605-9635 Limestone, brownish gray-light gray, crystalline.  
 9635-9640 Samples missing.  
 9640-9655 Limestone, as above.  
 9655-9670 Limestone, as above, brownish gray predominates.  
 9670-9680 Limestone, medium gray-medium light gray, dense.  
 9680-9695 Limestone, brownish gray-light gray, crystalline, some gray chert.  
 9695-9710 Limestone, medium gray predominates, dense, limestone, as above.  
 9710-9760 Limestone, medium gray-brownish gray-light gray, crystalline, fossiliferous.  
 9760-9765 Limestone, light brownish gray, intermixed with brownish gray, appears to have slight porosity.  
 9765-9770 Samples missing.  
 9770-9780 Limestone as above, fossiliferous.  
 9780-9810 Limestone, light brownish gray, very fine grained, dense.  
 9810-9840 Limestone, light gray, argillaceous, limestone, as above.  
 9840-9850 Limestone, light brownish gray, dense, very finely crystalline, fossil fragments.  
 9850-9880 Limestone, light gray-light brownish gray, dense, fossiliferous.  
 9880-9910 Limestone, medium-light gray, dense.  
 9910-9925 Limestone, medium dark gray predominates, fine grained, limestone as above.  
 9925-9940 Limestone, medium gray-light gray, dense.  
 9940-9950 Limestone, medium gray, tight, fossiliferous.  
 9950-9985 Limestone, medium gray to light gray, fine grained, the lighter limestone and as above.  
 9990-10,005 Limestone, medium gray-light gray, crystalline, somewhat argillaceous, fossiliferous.  
 10,005-10,015 Limestone, as above, some chert.  
 10,015-10,050 Limestone, as above, medium gray predominates, tight.  
 10,050-10,060 Limestone, medium gray to light gray, very fine grained, has small porosity.  
 10,060-10,080 Limestone, medium gray-medium light gray, dense.  
 10,080-10,095 Limestone, medium gray, fine grained, minute porosity.  
 10,095-10,105 Limestone, medium grey-brownish gray, dense, tight.  
 10,105-10,130 Limestone, medium gray, finely crystalline, argillaceous.  
 10,130-10,150 Limestone, medium gray-brownish gray, finely crystalline.  
 10,150-10,165 Limestone, medium gray, dense, some light brownish gray limestone.  
 10,165-10,175 Limestone, medium gray, dense, some black carbonaceous shale.

10,175-10,205 Limestone, medium gray, tight, also brownish gray limestone, somewhat argillaceous.

10,205-10,235 Limestone, medium gray-brownish gray, finely crystalline, dense.

10,235-10,245 Limestone, medium gray, dense, some black shale.

10,245-10,260 Limestone, medium gray-light gray, fine grained crystalline.

10,260-10,315 Limestone, medium gray-medium light gray, hard, very fine crystalline.

10,315-10,318 Samples missing.

#### CORES

10,318-10,333 Limestone, medium dark gray, argillaceous, very fine grained, dense.

10,333-10,338 Limestone, medium gray, argillaceous, very fine grained, dense.

10,938-10,378 Limestone, medium dark gray, slightly argillaceous, very fine grained, dense.

10,378-10,383 Limestone medium dark gray, dense, fine grained.

10,383-10,388 Limestone, medium gray, slightly argillaceous, fine grained, dense.

10,388-10,402 Limestone, medium dark gray, fine grained, dense.

10-402-10,430 Limestone, medium gray, argillaceous, very fine grained.

10,430-10,460 Limestone, medium gray, argillaceous, fine grained.

10,460-10,483 Shale, medium gray, very limy, compact.

10,483-10,492 Shale, medium dark gray, calcareous, slaty, compact.

10,492-10,495 Shale, medium dark gray, quite limy, compact.

10,495-10,501 Limestone, medium dark gray, argillaceous, fine grained.

10,501-10,509 Limestone, light brownish gray (5YR6/1), fine grained, dense.

10,509-10,515 Shale, black, carbonaceous, compact.

10,515-10,522 Shale, dark gray, compact, brittle, banded.

10,522-10,528 Dolomitic limestone, medium light gray, very fine grained, dense.

10,528-10,531 Shale, dolomitic, medium gray, compact.

10,531-10,534 Limestone, medium light gray, fine grained, shows banding.

10,534-10,540 Limestone, medium gray, medium grained, pinpoint porosity.

10,540-10,549 Dolomite, medium light gray, shaly, dense.

10,549-10,552 Limestone, medium gray, dolomitic, medium grained.

10,552-10,558 Dolomite, medium gray, fine grained, locally limy.

10,558-10,561 Limestone, medium light gray, fine grained, dense.

10,561-10,574 Dolomite, medium light gray, fine grained, limy.

10,574-10,577 Shale, dark gray, compact, brittle.

10,577-10,604 Shale, grayish black, compact, pyritiferous, platy.

10,604-10,609 Dolomitic limestone, medium dark gray, crystalline.

10,609-10,643 Dolomite, medium gray with banded, shale, greenish gray (5G6/1), pyritiferous.

10,643-10,646 Dolomite, grayish orange pink, hard, crystalline.

10,646-10,649 Dolomite, as above, some greenish tint.

10,649-10,652 Dolomite, grayish orange pink, hard crystalline.

10,652-10,661 Samples missing.

10,661-10,671 Dolomite as above, shale, greenish gray, compact.

10,671-10,691 Dolomite, pale yellowish brown, (10YR6/2), shaly, crystalline, pinpoint porosity.

10,691-10,701 Shale, light gray, compact, dolomitic.

10,701-10,713 Shale, pale brown, (5YR5/2) compact, dolomitic.

10,713-10,719 Shale, light greenish gray, compact, dolomitic, some coarse grained dolomite.

10,719-10,725 Shale, greenish gray (5G6/1), grayish red (10R4/2), compact, dolomitic.

10,725-10,731 Shale, pale brown (5YR5/2) dolomitic, interbedded anhydrite, white.

10,731-10,743 Shale, pale brown with anhydrite, dolomite, brown with interbedded grayish green shale.

10,743-10,749 Shale, pale brown with interbedded anhydrite, compact.

10,749-10,783 Samples missing.

10,783-10,801 Shale, light greenish gray, compact, dolomitic, pyritiferous, also shale, grayish brown (5YR3/2) with anhydrite.

10,801-10,849 Samples missing.

10,849-10,854 Anhydrite, medium dark gray.

10,854-10,856 Dolomite, light brownish gray (5YR6/1) fine grained, dense.

10,856-10,858 Limestone, medium dark gray, hard, finely crystalline.

10,858-10,861 Anhydrite, medium dark gray, medium gray.

10,861-10,866 Dolomite, light brownish gray, fine grained, sucrosic, anhydrite, brownish gray, grayish black.

10,866-10,877 Samples missing.

10,877-10,887 Limestone, medium dark gray-light brownish gray, hard crystalline.

10,887-10,897 Limestone, medium gray, fossiliferous, fine grained.

10,897-10,902 Limestone, medium light gray, sucrosic, anhydritic.

10,902-10,907 Limestone, light brownish gray, fine grained, anhydrite.

10,907-10,912 Limestone, brownish gray, dense, hard.

10,912-10,927 Limestone, as above, fossiliferous, some medium gray limestone.

10,927-10,932 Limestone, brownish gray-medium gray, fine grained, dense.

10,932-10,942 Limestone, brownish gray, very fine grained, dense.

10,942-10,947 Limestone, brownish gray, fossiliferous, some vuggy porosity.

10,947-10,956 Shale, medium dark gray, very hard, compact, dolomitic.

10,956-10,962 Anhydrite, medium light gray.

10,962-10,965 Anhydrite, as above, limestone, brownish gray, recrystallized.

10,965-10,968 Limestone, argillaceous, brownish gray, shows bedding.

10,968-10,971 Limestone, medium dark gray, very fine grained, dense, recrystallized.

10,971-10,974 Limestone, medium light gray, very fine grained, dense.

10,974-10,977 Samples missing.

10,977-10,980 Limestone, medium dark gray, argillaceous, dense.

10,980-10,983 Limestone, light brownish gray, fine grained, crystalline, dense.

10,983-10,986 Limestone, medium dark gray, argillaceous, fine grained, fossiliferous.

10,986-10,989 Anhydrite, medium gray.

10,989-10,992 Limestone, medium dark gray, very fine grained, dense.

10,992-10,998 Anhydrite, medium light gray, massive.

10,998-11,001 Anhydrite as above, intermingled light brownish gray limestone.

11,001-11,004 Anhydrite, medium light gray.

11,004-11,007 Anhydrite, light brownish gray, limy.

11,007-11,010 Limestone, dark gray, crystalline, to medium light gray, crystalline.

11,010-11,013 Limestone, medium light gray, crystalline.

11,013-11,016 Limestone, as above, shows banding.

11,016-11,022 Samples missing.

11,022-11,025 Limestone, light brownish gray, recrystallized.

11,025-11,028 Limestone, brownish gray, intermixed anhydrite, medium grain size, has some porosity.

11,028-11,031 Limestone, as above, fossiliferous, intermixed anhydrite.  
11,031-11,037 Limestone, medium dark gray, very fine grained, dense, hard.  
11,037-11,043 Anhydrite, light gray.  
11,043-11,046 Limestone, brownish gray, fine grained, partly recrystallized.  
11,046-11,049 Limestone, brownish black, very fine grained, dense, shows bedding.  
11,049-11,052 Limestone, brownish gray, recrystallized.  
11,052-11,055 Limestone, medium, dark gray, fine grained.  
11,055-11,058 Limestone, light brownish gray, fine grained.  
11,058-11,061 Anhydrite, medium light gray, limy.

END OF CORE

11,060-11,075 Limestone, medium gray, dense, shale, medium dark gray, slightly calcareous, brittle.

CORES

11,076-11,091 Limestone, brownish gray, fine grained, partly recrystallized.  
11,091-11,096 Limestone, brownish gray, very fine grained, dense.  
11,096-11,101 Anhydrite, medium dark gray, massive.  
11,101-11,106 Limestone, medium dark gray, very fine grained, dense.  
11,106-11,111 Anhydrite, brownish gray, very limy, hard.  
11,111-11,116 Limestone, light brownish gray, very fine grained, dense, some brownish gray.  
11,116-11,121 Limestone, brownish gray, fine grained, partly recrystallized.  
11,121-11,126 Anhydrite, medium light gray-greenish gray (5GY6/1).  
11,126-11,151 Limestone, brownish gray, dense, very fine grained.  
11,156-11,159 Limestone as above, interbedded with brownish black (5YR2/1) shale.  
11,159-11,164 Anhydrite, brownish gray.  
11,164-11,169 Limestone, medium dark gray, fine grained, dense.  
11,169-11,174 Dolomite, light brownish gray, sucrosic, good porosity, anhydritic.  
11,174-11,179 Limestone, medium dark gray, argillaceous, very fine grained, dense, some brownish gray limestone.  
11,179-11,184 Dolomite, light brownish gray, hard crystalline.  
11,184-11,194 Dolomite, as above, with intermixed anhydrite, shows porosity, crystalline.  
11,194-11,199 Dolomite, as above, some shale, medium dark gray, compact, limy.  
11,199-11,204 Dolomite, light brown, sucrosic, very good porosity.  
11,204-11,214 Anhydrite, brownish gray, some is limy.  
11,214-11,229 Dolomite, brownish gray, crystalline, medium grained, some microsucrosic.  
11,229-11,234 Limestone, dark brownish gray, medium grained, banded with black shaly material  
11,234-11,239 Limestone, as above, anhydrite.  
11,239-11,244 Limestone, medium gray, brownish, very fine grained, dense.  
11,244-11,254 Limestone, as above, some light brown, sucrosic.  
11,254-11,259 Samples missing.  
11,259-11,264 Limestone, medium dark gray, very fine grained, very dense, dolomite, brownish gray, very fine grained and dense.  
11,264-11,267 Dolomitic, very light gray, microsucrosic.  
11,267-11,272 Dolomite, as above, limestone, brownish gray, very fine grained, dense.

11,272-11,277 Limestone, light brown, medium grained, partly recrystallized.  
11,277-11,282 Sample, same as 11,267-11,272.  
11,282-11,287 Anhydrite, medium dark gray.  
11,287-11,297 Limestone, dark grayish brown, very fine grained, very dense.  
11,297-11,302 Limestone, light brownish-gray, medium grained, crystalline.  
11,302-11,307 Dolomite, very light gray, microsugrosic, anhydritic.  
11,307-11,312 Dolomite, light brownish gray, crystalline, hard.  
11,312-11,317 Limestone, medium gray, fine grained.  
11,317-11,322 Limestone, as above, shows banding, limestone, light brownish gray, very fine grained, dense.  
11,322-11,327 Limestone, brownish gray, very fine grained, dense.  
11,327-11,331 Limestone, brownish gray, medium grained.