

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 78

Summary of the Champlin Refining Elmer Tank #1 Well
Williams County, North Dakota
Well #48, Permit #65

by Sidney B. Anderson
June, 1954

Champlin Refining Company - Elmer Tank Well No. 1, Williams County, North Dakota, C NE 1/4, SE 1/4, Section 7, T. 156 N., R. 96W. (657 feet from East line and 1980 feet from South line). Elevation 2311 D.F. 2301 G.L. Total Depth 12,232.

The Champlin Tank well was spudded January 1, 1952 and 13 3/8" casing was set at 586 with 750 sacks of cement. 5,023 feet of 10 1/2" casing was set and 1,120 feet 9 5/8" casing was set. 1,120 of 9 5/8" casing was recovered leaving 5,023 feet of 10 1/2" casing in the hole. The well was plugged and abandoned September 23, 1952.

TESTS

DST #1 4717-61, recovered 4250 feet slightly gas cut salt water.
DST #2 7595-7740, open 1 hr., recovered 7240 feet salt water.
DST #3 8596-8753, open 57 min., recovered 630 feet mud.
DST #4 8740-83, open 1 hr., recovered 90 feet mud.
DST #5 8750-8830, open 5 hrs., recovered 810 feet water cushion slight scum oil, 300 feet gas cut salt water, 1 pint free oil.
DST #6 8830-8930, open 3 hrs., recovered 370 feet slightly gas cut mud.
DST #7 9706-9726, open 5 hrs., recovered 1800 feet water cushion, 640 feet mud.
DST #8 10,043-10,178, open 7 hrs., recovered 135 feet, oil and gas cut mud and 1 pint free oil.
DST #9 10,400-10,458, recovered 1300 feet slightly gas cut salt water.
DST #10 10,560-10,644, recovered 3570 feet salt water.
DST #11 10,680-10,727, recovered 335 feet slightly oil and gas cut mud.
DST #12 10,760-10,879, open 4 hours, recovered 350 feet salt water.
DST #13 11,185-11,220, recovered 2800 feet water cushion, 130 feet mud.
DST #14 11,195-11,310, open 4 hrs., recovered 90 feet slightly gas cut mud, FP 1375, SIP 1400 feet 15 min.
DST #15 11,975-12,103 packer failed.
DST #16 11,967-12,043, packer failed.
DST #17 11,673-11,943 packer failed.
DST #18 98-12,097, recovered 225 feet mud.
DST #19 12,108-12,404 packer failed.
DST #20 12,232 packer failed.

Attempted two DST's 8740-8870 packer failed.
Samples from 7310-7370 contain some sandstone with good fluorescence.

FORMATION TOPS

Formation tops adjusted to electric log. Colors determined by rock color chart.

Cretaceous System	
Pierre Formation	1555
Niobrara Formation	3637
Greenhorn Formation	4043
Dakota	4714
Jurassic System	
Morrison Formation	5130
Sundance Formation	5329
Piper Formation	5935
Triassic System	
Spearfish Formation	6193
Mississippian System	
Amsden Formation	7010
Big Snowy Group	7195
Kibbey Lime	7698
Charles Formation	7835
Mission Canyon Formation	8578
Lodgepole Formation	8820
Englewood Formation	10,070
Devonian System	
Lyleton Formation	10,300
Nisku Formation	10,360
Duperow Formation	10,455
Souris River Formation	10,815
Dawson Bay Formation	11,160
Prairie Evaporites	11,310
Winnipegosis Formation	11,637
Ashern Formation	11,805
Silurian System	
Interlake Group	11,903
Total Depth	12,232

- 1110 Sandstone, lignite, light olive gray, medium green calcareous sandstone and lignite, and some hard tan shale, ironstone.
- 1120 Lignite sandstone, much lignite some sandstone as above.
- 1130 Sandstone lignite, much sandstone as above and some lignite.
- 1150 Sandstone lignite, sandstone and lignite as above and some ironstone fragments.
- 1160 Siltstone lignite, light olive gray siltstone, few medium grained quartz and lignite.
- 1170 Sandstone, light olive gray, fine to medium grained, shaly sandstone.
- 1190 Sandstone, lignite, sandstone as above and lignite.
- 1200 Siltstone, light olive gray, few quartz grains and lignite.
- 1210 Sandstone, light olive gray and lignite.
- 1230 Siltstone and lignite as above, little quartz sand.
- 1340 Lignite and a little siltstone.
- 1350 Lignite and siltstone, light olive gray.
- 1360 Lignite and light olive gray, fine to medium sandstone.
- 1420 Sandstone as above and lignite (mostly sandstone).
- 1430 Limestone, yellow gray, silty and light gray, fine grained, dense limestone.
- 1440 Lignite and some yellow gray silty limestone.

1460 Lignite and light olive gray siltstone.
1470 Lignite.
1500 Lignite and siltstone as above.
1510 Sandstone, light olive gray, fine grained, calcareous.
1550 Sandstone, yellow gray, limey, and lignite.
1610 Siltstone, light olive gray, little sandstone and lignite as above.
1690 Sandstone, yellow gray, limey (fine to medium grained) and some lignite.
1700 Limestone, yellow gray, slightly silty and much lignite.
1710 Limestone, yellow gray, silty and some lignite.
1720 Lignite and some yellow gray, silty limestone.
1730 Lignite, little yellow gray limestone and little light gray shale.
1740 Lignite, yellow gray silty limestone and little light gray shale.
1750 Limestone, yellow gray silty and some lignite.
1760 Limestone as above; lignite; light gray shale and coarse sub-round to angular free quartz.
1820 Shale, lignite and limestone as above and little coarse free quartz.
1830 Limestone, yellow gray as above, few pieces of gray shale, some light gray fine grained limestone and little reddish sandy limestone.
1850 Limestone as above, much light gray, fine grained dense limestone.
1870 Yellow gray limestone and light gray shale.
1900 Limestone, yellow gray, fine grained; little light gray shale and lignite.
1910 Shale, light gray and some yellow gray limestone as above.
1940 Shale as above.
1980 Shale, light olive gray lumpy.
2010 Shale, medium light gray, N6.
2040 Shale, light olive gray, some lumpy.
2200 Shale, medium light gray to olive gray, lumpy.
2220 Shale, light olive gray, lumpy.
2230 Shale as above, a few inoceramus prisms.
2290 Shale as above.
2330 Shale, medium light gray to light olive gray, lumpy.
2370 Shale, light olive gray, lumpy.
2400 Shale, medium light gray and light olive gray lumpy.
2410 Shale as above with inoceramus prisms.
2460 Shale, medium light gray and light olive gray lumpy.
2480 Shale, green gray with some brownish.
2700 Shale, green gray to medium light gray.
2710 Shale as above and little coal (cave ?).
2790 Shale, light olive gray to green gray.
2800 Shale as above and coal.
2910 Shale, light olive gray.
2970 Shale as above and coal.
3450 Shale, light olive gray.
3480 Shale, medium light gray.
3500 Shale, light olive gray, slightly silty.
3510 Shale, light gray to light olive gray.
3610 Shale, light gray.
3630 Shale, light gray to medium dark gray.
3700 Shale as above with white specks.

3730 Shale, light gray to dark gray, few white specks.
 3820 Shale, much medium light gray, silty.
 3960 Shale, medium light gray, some medium light gray, silty.
 4000 Shale, medium light gray.
 4020 Shale, medium light gray, little dark gray.
 4033 Shale, as above to medium dark gray, some with white specks.
 4050 Shale as above, with white specks.
 4150 Shale, medium light gray and little medium dark gray.
 4170 Shale, medium light gray.
 4280 Shale as above, little medium dark gray.
 4418 Shale, medium light gray.
 4460 Shale as above to medium dark gray.
 4508 Shale, medium light gray.
 4580 Shale as above to medium dark gray.
 4630 Shale, medium light gray.
 4631 Circ. 30 minutes. Shale, medium dark gray.
 4645 Circ. 30 minutes. Shale, mostly medium light gray.
 4645 Circ. 45 Minutes. Shale, mostly medium light gray.
 4660 Shale, medium light gray.
 4718 Circ. 15 minutes. Shale, medium light gray to light brown.
 4718 Circ. 30 minutes. Shale, medium light gray to medium dark gray.
 4718 Circ. 45 minutes. Shale as above and light brown shale.
 4790 Shale, medium dark gray.
 4850 Sandstone, little very fine grained, white to light gray; shale as above.
 4880 Sandstone, whitish to light gray, fine to medium grained. Shale.
 4900 Sandstone and shale as above and some coarse free quartz.
 4910 Shale as above, very little sandstone.
 4960 Sandstone, whitish to light gray, fine grained, coarse free quartz, much shale as above.
 4980 Shale as above and little light gray, fine grained sandstone.
 4990 Shale and sandstone as above, much reddish to brownish ironstone.
 5020 Shale as above, and very little fine grained sandstone as above.
 5060 Sandstone, white, fine grained.
 5070 Shale, medium dark gray and very little white to light gray, fine grained sandstone.
 5084 Sandstone as above and little shale as above.
 5084 Circ. 75 min. Sandstone and shale as above, some pinkish sandstone, fine grained with some coarse round grains.
 5103 Sandstone, whitish to light gray, fine grained, little glauconitic; shale as above.
 5103 Circ. 30 min. Sandstone, white to medium grained.
 5140 Sandstone, white to tan and light gray, fine to medium grained.
 5150 Shale, medium dark gray.
 5160 Shale, medium dark gray to brownish and little glauconitic fine grain sandstone.
 5170 Shale, medium dark gray.
 5180 Shale as above and little light gray, fine grained sandstone.
 5190 Shale, medium dark gray.
 5200 Shale as above, light gray fine to medium grained sandstone.
 5260 Shale as above and some light green gray to light gray shale.
 5270 Shale as above and little very fine grained light gray sandstone.
 5290 Shale as above and some light gray fine grained sandstone.
 5300 Shale as above and little light gray, fine grained sandstone.

5320 Shale, medium dark gray to light gray; little fine grained green sandstone (glaucopitic ?) and light gray sandy limestone.

5330 Shale as above, little green to light gray, fine grained sandstone.

5340 Shale, medium dark gray, light gray and green gray.

5370 Shale as above and little light gray, very fine grained sandstone.

5380 Shale as above and some fine grained, light gray sandstone.

5390 Shale, green gray, little medium dark gray and little fine grained, light grained sandstone.

5420 Shale as above and much whitish fine grained sandstone, very calcareous. (amidiscus cretacia 5390-5400).

5430 Shale and sandstone as above with little glauconite in sandstone.

5480 Whitish sandstone and shale as above.

5550 Shale, greenish gray, very little sandstone and little medium dark gray shale.

5600 Shale as above, little medium dark gray and brownish shale.

5620 Shale as above and little light gray, fine grained sandstone.

5770 Shale as above.

5780 Shale as above and little medium to light gray, fine grained sandstone, some with glauconite.

5790 Shale as above, few pieces of reddish shale and little light gray shaly limestone.

5800 Shale as above and few pieces of whitish to light gray, fine grained sandstone, some with glauconite.

5830 Shale, greenish gray to medium dark gray.

5840 Shale as above and few pieces of fine grained, light gray to greenish sandstone.

5850 Shale as above and light brown gray, fine grained to slightly fragmental limestone.

5860 Limestone and shale as above, little brown, very limey sandstone, fine grain.

5900 Limestone, brown fragmental.

5950 Shale, variegated, little limestone as above.

5970 Limestone, yellow gray, fine grained, dense; shale as above.

5980 Limestone as above, some brown gray fragmental to light gray, very fine grained, dense.

6000 Limestone, yellow gray to light gray, fine grained, dense; variegated shale.

6020 Limestone, yellow gray, fine grained, dense and variegated shale.

6030 Limestone as above.

6050 Limestone as above and much pale brown 5YR5/2, fine grained dense.

6060 Limestone, pale brown, fine grained, dense.

6070 Limestone, yellow gray, fine grained, dense.

6080 Reddish shale and limestone as above with red shale staining.

6110 Shale, mostly shale as above, little green shale and limestone as above.

6120 Shale, reddish and greenish, few pieces of white anhydrite.

6130 Shale as above and brown gray limestone, some with white anhydrite inclusions.

6140 Shale and limestone as above.

6150 Shale as above, white granular anhydrite, little brown limestone, with anhydrite inclusions.

6200 Reddish shale, some greenish shale; few pieces of black shale and white anhydrite.

6250 Shale as above, little white anhydrite and reddish very fine grained sandstone.

6330 Shale, dark reddish brown, and greenish; pale reddish brown very fine grained sandstone.

6410 Shale as above, very little sandstone as above.

6440 Much sandstone as above, some coarse round free quartz and shale as above.

6460 Much sandstone as above, very little coarse round free quartz and shale as above.

6480 Much shale as above, some sandstone as above and little free quartz.

6500 Shale and sandstone as above, several salt crystals.

6570 Shale, reddish as above, little greenish shale, very little fine grained, red sandstone, some anhydrite.

6600 Shale as above, some fine grained sandstone as above and round free quartz.

6620 Sandstone, much fine grained reddish as above; shale as above and few round quartz grains.

6640 Shale and sandstone as above, some very limey sandstone and some anhydrite; pale reddish brown siltstone.

6660 Sandstone and shale as above, pale reddish brown siltstone.

6740 Siltstone, sandstone, shale, anhydrite as above; some white anhydrite.

6750 As above and few coarse round quartz grains.

6880 Siltstone, pale reddish brown, very little fine grained sandstone.

6950 Siltstone as above, some very fine grained sandstone and few round free quartz grains.

7020 Siltstone, pale reddish brown and very fine grained sandstone, few round free quartz grains.

7030 Siltstone and sandstone as above, some white anhydrite.

7040 Sandstone, pale reddish brown, fine grained and little white anhydrite.

7050 Dolomite, whitish to very pale reddish, very fine grained, dense.

7070 Dolomite, whitish, very fine gained, dense.

7120 Dolomite, white to very pale reddish or very pale reddish purple dolomite as above.

7140 Dolomite as above and some pale red purple calcareous shale.

7170 Shale as above, with some pale red purple fine grained, dense limestone, some dolomite as above.

7210 Shale, pale red purple and pale red purple fine grained dense limestone. (7220 - much moderate red brown waxy shale) and much red brown shale (spearfish cave ?)

7240 Shale as above and very little limestone.

7270 Shale as above and very little limestone, some reddish sandstone, fine grained spearfish cave.

7290 Shale, variegated, mostly reddish and purplish, some yellowish to greenish.

7300 Shale, variegated, mostly purplish and dark gray, some reddish.

7370 Sandstone, medium gray to medium dark gray, fine grained, good fluorescence and much shale as above. Very slight cut with carbon tetrachloride.

7400 Shale as above and very little sandstone.

7430 Shale as above.

7470 Limestone, brown gray, fine grained and shale as above.

7510 Limestone, light to medium gray, fine grained; shale as above.
 7540 Shale as above.
 7560 Shale as above and little white medium grained sandstone.
 7610 Shale as above and reddish fine grained calcitic sandstone.
 7620 Shale as above and little light brown, fine grained sandstone.
 7627 Little sandstone as above, pale reddish fine grained sandstone, much medium grained round free quartz; shale as above.
 7630 Shale as above, very little sandstone.
 7660 Shale as above and some reddish fine grained sandstone.
 7680 Shale as above and very few pieces of reddish fine grained sandstone.
 7720 Shale as above.
 7730 Limestone, brown gray, fine grained dense and shale as above.
 7740 Shale and limestone as above, pinpoint porosity in limestone.
 7760 Shale, variegated.
 7770 Shale, variegated, gray red very fine grained sandstone.
 7780 Shale, variegated, some sandstone as above, little red brown and light gray, fine grained sandstone and little brown gray, fine grained dense limestone.
 7790 Sandstone, pale red very fine grained silty, shale as above.
 7810 Sandstone, as above.
 7820 Sandstone, moderate red orange, fine grained, calcareous.
 7840 Sandstone as above and some variegated shale.
 7850 Sandstone, moderate red orange to moderate red brown, fine grained; siltstone; variegated shale. Microlog shows salt at 7854-7877.
 7880 Sandstone, pale red, silty, very fine grained. Microlog shows salt 7886-8068.
 7900 Shale and sandstone as above, white anhydrite.
 7940 Siltstone, pale red limey, sandy; little white anhydrite.
 8050 Siltstone as above, very little anhydrite. Microlog shows salt 8086-8111, 8126-8134, 8142-8159.
 8160 Siltstone as above, white to pink anhydrite.
 8180 Siltstone, as above, white anhydrite and medium green anhydritic limestone, few pieces of salt.
 8190 Limestone, light gray oolitic, white anhydrite as above, little salt and siltstone as above.
 8200 White anhydrite, siltstone, few pieces of salt and oolitic limestone as above.
 8250 White anhydrite.
 8270 White anhydrite, some medium gray dolomitic fine grained limestone. Microlog shows salt 8198-8254.
 8290 White anhydrite; medium gray dolomitic limestone and brownish oolitic limestone.
 8310 Limestone, brown, fine grained, little pinpoint porosity and some anhydrite.
 8320 Limestone and anhydrite as above; some medium gray limestone, fine grained.
 8350 White anhydrite, medium light gray, fine grained, dense, dolomitic limestone. Microlog shows salt 8345-8387.
 8420 Anhydrite and limestone as above; little fine grained to fine granular limestone.
 8430 Limestone, brown gray, fine grained, dense; some anhydrite.

8470 Limestone, brown gray, fine grained, dense, some medium light gray, fine grained, dense, little pinpoint porosity; some red shale and some anhydrite.

8490 Much red shale, some brown gray and medium light gray limestone, white anhydrite.

8500 Shale as above and few salt crystals.

8530 Limestone, brown gray to pale yellow brown, some pinpoint porosity, few pieces white anhydrite to red shale. Microlog shows salt, 8528-8578.

8540 Limestone, medium light gray, fine grained, dense dolomitic, little anhydrite; brown gray limestone and red shale.

8600 Limestone, medium light gray, fine grained, dense, dolomitic. Little white to light gray anhydrite.

8610 Shale, much reddish silty, some reddish, fine grained sandstone (cave?) little dolomitic limestone and anhydrite as above.

8620 Shale, reddish brown, silty; little reddish brown, fine grained sandstone.

8630 Shale and limestone as above; white to light gray anhydrite and medium light gray, fine grained dolomite.

8640 White to light gray anhydrite and some medium light gray dolomite.

8650 Shale, reddish brown, some anhydrite and dolomite as above.

8670 Limestone, brown gray to light brown gray, fragmental dense; some reddish silty shale and little reddish fine grained sandstone.

8690 Dolomite, medium light gray, fine grained, dense; reddish brown silty shale and anhydrite.

8700 Limestone, brown gray, fragmental, dense.

8710 Limestone, light brown gray to brown gray, fragmental, little pinpoint porosity.

8736 Limestone, light brown gray, fine grained to fragmental, dense.

8830 Limestone, light brown gray, fragmental, little pinpoint porosity.

9160 Limestone, brown gray, fragmental, dense.

9170 Limestone, light brown gray, fragmental, dense.

9200 Limestone, light brown gray, fragmental to brown gray fragmental, dense.

9250 Limestone, brown gray, fragmental, dense.

9300 Limestone, light brown gray to brown gray, fragmental, dense.

9330 Limestone, dark brown gray and some light brown gray, fragmental, dense.

9340 Limestone, dark brown gray and much whitish to yellow gray, fragmental.

9350 Limestone, dark brown gray to light brown gray, fragmental, dense.

9370 Limestone, dark brown gray to pale yellow brown, fragmental, dense.

9390 Limestone, mostly pale yellow brown, fragmental, some dark brown gray, fragmental.

9440 Limestone, pale yellow brown, fragmental.

9470 Limestone, brown gray, fine grained, dense; very light gray, fine grained, dense limestone.

9540 Limestone, medium dark gray to medium light gray, fine grained, dense.

9560 Limestone, medium light grey to dark brown gray, fine grained, dense.

9600 Limestone, medium dark gray to medium light gray, fine grained, dense.

9620 Limestone as above and few pieces of chert.
 9690 Limestone, medium dark gray, fine grained, dense.
 10060 Limestone, medium dark gray to light gray, fine grained, dense.
 10052 Circ. 30 min. Limestone as above and few pieces of dark gray shale.
 10057 Circ. 30 min. Limestone as above.
 10057 Circ. 1 hr. Limestone as above and few pieces of dark gray shale.
 10057 Circ. 1 1/2 hrs. Limestone as above and few pieces of dark gray shale.
 10070 Limestone and shale as above.
 10100 Shale, dark gray.
 10130 Shale as above and few pieces of fine grained, medium gray sandstone.
 10178 Circ. 1 hr. Shale as above and some fine grained, medium gray limey sandstone; few pieces of light brown gray limestone.
 10178 Circ. 2 hrs. Shale, dark gray, very little fine grained light gray sandstone.
 10200 Shale as above and little whitish to light gray, fine grained limey sandstone.
 10220 Shale as above, light gray to pale yellow brown, little pale orange, fine granular limestone, little brown gray, fine grained, dense, crystalline limestone.
 10270 Limestone, pale orange, fine granular, dolomitic.
 10300 Dolomite, pale orange to pinkish orange, fine granular and some brown gray, fine grained, dense, crystalline limestone.
 10320 Dolomite and limestone as above; some pale yellow brown, fine grained, dense, limestone.
 10330 Dolomite, pale orange to pinkish orange, fine granular.
 10350 Dolomite as above; green argillaceous limestone.
 10360 Dolomite as above and some light gray dolomite.
 10370 Dolomite as above, some brown gray, fine grained, dense, crystalline limestone; little white to pink anhydrite.
 10390 Limestone, light gray, fine granular to brown gray, fine grained, dense, crystalline.
 10410 Limestone, pale yellow brown to brown gray, fine grained, dense, crystalline; few pieces of white anhydrite.
 10440 Limestone, light brown gray, fragmental and some brown gray, fine grained, dense crystalline.
 10450 Limestone, light brown gray, fragmental.
 10460 Limestone, brown gray, fine grained, dense, crystalline; some limestone as above
 10457 Circ. Limestone, light brown gray, fragmental and some brown gray, fine grained, dense; crystalline.
 10457 Circ. Limestone, as above.
 10480 Limestone, brown gray, fine grained, dense, crystalline.
 10550 Limestone as above to light brown gray, fine granular to fragmental.
 10600 Limestone, brown gray, fine grained, dense, mostly light brown gray fragmental.
 10610 Limestone as above and light brown, fine granular with fair pinpoint porosity.
 10630 Limestone, light brown gray, fine granular (with fair pinpoint porosity) to fragmental and brown gray, fine gained, dense.
 10644 Circ. Limestone, as above.

10680 Limestone, brown gray, fine grained, dense, crystalline and some light brown gray, fragmental.
 10720 Limestone, brown gray, fine grained, dense, crystalline.
 10770 Limestone as above to light brown, fine grained, dense.
 10770 Limestone, light brown gray, fragmental.
 10800 Limestone, light brown, fine grained to fragmental and brown gray, fine grained, dense, crystalline.
 10837 Limestone, light brown, fine grained and brown gray, fine grained, dense, crystalline.
 10840 Limestone as above and some dark gray shale (baked).
 10850 Limestone as above.
 10879 Limestone, brown gray, fine grained crystalline and tan fine granular.
 10879 Circ. Limestone as above, mostly brown gray, fine grain, crystalline, dense.
 10900 Limestone as above with some tan, fine granular limestone.
 10950 Limestone, brown gray, fine grained, dense crystalline and much light brown or tan, fine granular.
 10960 Limestone, brown gray, fine grained, dense, crystalline and light gray, very fine granular.
 11040 Limestone, brown gray, fine grained, dense crystalline and some light gray, very fine granular limestone.
 11070 Limestone, brown gray, fine grained, dense, crystalline and light gray, very fine granular.
 11080 Limestone, much very light brown gray to light gray, fine granular.
 11090 Limestone, light brown gray, fine granular.
 11150 Limestone as above and brown gray, fine grained, crystalline, dense.
 11160 Limestone, light gray, fine grained, dense to brown gray, fine grained dense, crystalline.
 11190 Limestone, brown gray, fine granular, dense.
 11210 Dolomite, brown gray, fine granular to fragmental, calcitic.
 11220 Limestone, brown gray, fine granular to granular, with some pinpoint porosity.
 11270 Dolomite, brown gray, fine granular to granular, slightly calcitic, with fair pinpoint porosity.
 11280 Dolomite as above and brown gray, fine grained, dense limestone.
 11300 Limestone, brown gray, fine grained to very fine granular dense.
 11310 Limestone, brown gray, fine granular.
 11310 Circ. 2 hrs. Limestone as above and brown gray, very fine grained, dense limestone.
 11310 Circ. 3 hrs. Limestone as above.
 11330 Limestone, brown gray, very fine granular to brown gray, fine grained, dense, crystalline limestone.
 11350 Dolomite, brown gray, granular to fine grained, dense.
 11360 Limestone, light brown gray, very fine granular.
 11370 Dolomite, light brown gray, very fine granular and brown gray, fine grained to very fine granular limestone.
 11410 Dolomite as above.
 11440 Dolomite as above and few pieces of brownish anhydrite.
 11500 Dolomite, light brown gray, fine granular and brown gray, fine grained, dense; brown gray, fine grained, dense, limestone.
 11600 Limestone and dolomite as above and some reddish calcareous shale.

11690 Limestone and dolomite as above, mostly reddish argillaceous limestone.

11800 Limestone, light brown gray to brown gray, fine grained, dense, crystalline to fragmental, dense.

11860 Limestone, light brown gray, fine grained, dense to brown gray, fine grained, dense, crystalline.

11870 Limestone, light gray, fine grained, dense; brown gray, fine grained, dense crystalline dolomite.

11900 Missing samples.

11920 Limestone, brown gray, fine grained, dense, crystalline.

11970 Limestone as above and little very pale brown, fine grained, dense dolomite.

11980 Dolomite as above and much reddish argillaceous and anhydritic dolomite.

12000 Limestone, whitish to very pale yellow brown, fine grain dense to dense crystalline.

12010 Limestone, brown gray, fine granular, dense and very light gray dense limestone; very light gray to tan anhydrite.

12020 Limestone, very pale yellow brown, fine grained, crystalline, some pinpoint porosity and some anhydrite.

12027 Circ. Limestone, very pale yellow brown, fine grained, crystalline to fragmental, dense, slightly dolomitic.

12060 Limestone as above to pale pinkish, some pinpoint porosity.

12232 Circ. 1 hr. Limestone, very pale yellow brown to almost whitish, fine grained, dense, crystalline, slightly dolomitic.

12232 Circ. 2 hr. Limestone as above to pale yellow brown. 3 hr. circ. as above.