

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 153

Summary of the Phillips Petroleum Company, Phillips - Carter No. Dak. No. 1  
Morton County, North Dakota  
Well No. 26 - Permit No. 42

by Richard Maywald

Phillips Petroleum Company, Phillips - Carter North Dakota No. 1, Morton  
County, North Dakota, Location: C NE NW Section 29, T. 136N., R. 81W.  
Elevation: 1991 ground, 2005 K.B.

The Phillips Petroleum Company, Phillips - Carter North Dakota No. 1  
was spudded December 30, 1950, drilled to a total depth of 7790, found dry,  
and plugged June 8, 1951.

Logging Record: Schlumberger electric log.

Coring Record:

3136 - 3140	4921 - 4942
3162 - 3179	5670 - 5709
4021 - 4036	5720 - 6066
4210 - 4226	7788 - 7790
4450 - 4500	

Testing Record:

DST #1, 4912-22: Open 2 hours, shut in 15 minutes, received 25' drilling  
fluid, 720' black sulfur water and 1/2 pt. 30° brown oil in test tool. Initial  
hydrostatic mud pressure 2631 psi, initial flow pressure 295 psi, final flow  
pressure 468 psi, shut in pressure 1965 psi, final hydrostatic mud pressure  
2602 psi.

Casing Record:

15 1/2" at 20' with 27 sacks cement  
13-3/8" at 405.96 with 500 sacks cement

Plugging Record:

50 sacks cement at 4925  
100 sacks cement at 3850  
70 sacks cement at 3200  
300 sacks cement at 780  
6 sacks cement at surface

Formation tops were determined from samples and electric logs.  
Doubtful or obscure formation tops were not picked. Color names and  
identifying numbers are taken from the 1948 Rock-color Chart which is  
distributed by the National Research Council, Washington, D.C.

FORMATION TOPS

Cretaceous system  
    Pierre formation                   722  
    Greenhorn formation               2450  
Dakota Group sandstones

"Muddy" formation	2875
Basal Cretaceous sandstones	3105
Jurassic system	
Piper limestone	3652
Triassic system	
Spearfish formation	3870
Triassic system	
Spearfish formation	3870
Mississippian system	
Amsden formation	4010
Big Snowy group	4070
Charles formation	4410
Mission Canyon formation	4745 ?
Lodgepole formation	5035
Englewood formation	5580
Devonian system	
Lyleton formation	5615
Nisku formation	5650
Duperow formation	5710
Ashern formation	6050 ?
Silurian system	
Interlake group	6100
Ordovician system	
Stony Mountain formation	
Upper member	6315
Lower member	6400
Red River formation	6495
Winnipeg formation	
Shale member	7180
Sand member	7315
Cambrian system	7440
Pre-Cambrian	7790
Total Depth	7790

0-30	Sandstone, pale yellowish, fine grained, friable, subangular quartz grains.
30-45	Sandstone, light olive gray, fine- grained, subangular quartz with scattered dark mineral grains.
45-80	Sandstone, dark yellowish brown, friable with very fine-grained sand surrounding fine grained quartz.
80-200	Shale, pale yellowish brown, spongy to compact, sandy micaceous.
200-210	Siltstone, grayish orange pink, very fine grained, micaceous, scattered lignitic material, friable.
340-410	Shale, light brownish gray, finely micaceous, compact, sandy.
410-480	Sandstone, pale yellowish brown, very fine grained, calcareous, spongy.
480-550	Sandstone, as above, but more compact, and grading in color to light olive gray, and micaceous.
550-710	Sandstone, light greenish gray (5GY6/1) very fine grained, medium compact, calcareous, abundant dark green mineral grains.
710-740	Sandstone, as above, but grading into a siltstone texture.
740-830	Sandstone, yellowish gray (5Y7/2) micaceous, compact, very fine grained.

830-850 Shale, light olive gray (5Y6/1) finely micaceous, lumpy and compact, lignitic fragments.

850-870 Sandstone, yellowish gray, compact, calcareous, micaceous, silty.

870-980 Shale, light brownish gray, lumpy and compact, bentonitic, slightly calcareous, scattered pyrite and mica.

980-1000 No samples.

1000-1020 Shale, as above, some scattered black lignitic material.

1020-1100 Shale, light gray, lumpy and compact, very finely micaceous, bentonitic.

1100-1260 Shale, medium light gray, flaky and brittle, bentonitic.

1260-1300 Shale, light gray, scattered medium sized biotite flakes, brittle and lumpy, slightly calcareous, bentonitic.

1300-1410 Shale, light gray, lumpy and compact, slightly bentonitic.

1410-1430 Shale, as above, scattered, pieces of white bentonite, bentonitic.

1430-1510 Shale, as above bentonitic.

1510-1540 Shale, as above, with white bentonite, bentonitic.

1540-1550 Shale, as above with Inoceramus prisms.

1550-1580 Shale, light gray, lumpy and compact, white bentonite, bentonitic.

1580-1630 Shale, light gray, lumpy and compact, bentonitic.

1630-1660 Shale, brownish gray, lumpy and compact, layers of white, bentonite.

1660-1720 Missing.

1720-1780 Shale, medium light gray, lumpy and compact, bentonitic, some white bentonite.

1780-1870 Shale, medium gray, lumpy and spongy, bentonitic, some white bentonite, slightly calcareous to calcareous.

1870-1990 Shale, light gray, lumpy and compact, "white specks", calcareous, bentonitic.

1990-2060 Shale, light gray, lumpy and compact, calcareous, bentonitic, white bentonite.

2060-2140 Shale, light gray, lumpy and compact, bentonitic.

2140-2150 Missing.

2150-2400 Shale, as above, scattered white bentonite.

2400-2450 Shale, medium gray, lumpy and spongy, bentonitic, from 2410-2420 abundant white bentonite.

2450-2500 Shale, medium gray, lumpy and spongy, bentonitic, white bentonite, Inoceramus prisms, calcareous.

2500-2550 Limy shale, light gray, abundant "white specks", lumpy and compact, scattered Inoceramus prisms.

2550-2600 Limy shale, medium gray, with gradually fewer "white specks", lumpy and compact, scattered Inoceramus prisms, some particles of white bentonite.

2600-2790 Shale, medium dark gray, laminated and compact, calcareous, scattered fragments of a light gray, limy shale, scattered Inoceramus fragments.

2790-2830 Shale, medium gray, lumpy and compact, bentonitic, calcareous.

2830-2900 Shale, medium dark gray, laminated and compact, bentonitic, finely micaceous.

2900-3030 Shale, medium dark gray, flaky and brittle, finely micaceous, some Inoceramus fragments scattered at intervals; some black carbonaceous fragments.

3030-3050 Shale as above, shale, medium light gray, lumpy and compact.

3050-3120 Shale, medium gray, flaky and brittle, finely micaceous.

3120-3210 Shale, medium gray to light gray, flaky and brittle, the medium gray shale is silty.

3210-3280 Silty shale, light gray, lumpy and compact, unconsolidated sand, medium to coarse-grained, subrounded, coarse grained sandstone, grains subrounded, cemented with pyritic cement, abundant subangular coarse grained quartz.

3280-3300 Shale, light gray, lumpy and spongy, slightly calcareous, silty.

3300-3330 Shale, light gray, lumpy and compact, finely micaceous.

3330-3350 Shale, greenish gray, laminated and compact, very bentonitic.

3350-3420 Sandstone, grayish orange pinks very fine-grained, friable calcareous cemented, green shale as above, scattered pieces of white bentonite.

3420-3460 Sandstone, light brown (5YR6/4), very fine grained, calcareous cement.

3460-3480 Sandstone, pale yellowish brown (10YR6/2), very fine grained, calcareous very finely micaceous.

3480-3490 Sandy siltstone, light brownish gray, argillaceous, finely micaceous.

3490-3500 Sandy siltstone, pale brown (5YR5/2), argillaceous, scattered lineated carbonaceous fragments.

3500-3530 Silty shale, light olive gray (5Y6/1), calcareous and bentonitic, finely micaceous.

3530-3560 Shale, medium gray, platy, finely micaceous.

3560-3600 Siltstone, pale yellowish brown, compact, argillaceous.

3600-3620 Shale, limy, light brown (5YR6/4), massive, shaly cavings from above.

3620-3670 Shale as above.

3670-3690 Limestone, grayish orange pink, sublithographic, subangular, shale cavings from above.

3690-3710 Shale, medium gray, flaky, slightly calcareous, bentonitic.

3710-3770 Dolomite, pinkish gray, dense, very finely crystalline, subangular, shale cavings from above.

3770-3800 Shale, moderate reddish orange (10R6/6) massive, with scattered particles of white sucrosic gypsum.

3800-3830 Gypsum, white sucrosic, shale as above.

3830-3850 Shale, medium light gray, flaky, brittle.

3850-3940 Sandstone, medium fine grained, rounded grains, friable, moderate orange pink, shale cavings from above.

3940-3950 Poor sample.

3950-4040 Missing.

4040-4050 Poor sample.

4050-4070 Shale, medium gray, splintery, brittle.

4070-4090 Shale, medium dark gray, finely micaceous, platy, brittle.

4090-4120 Missing.

4120-4180 Shale as above, moderate reddish orange shale cavings.

4180-4200 Missing.

4200-4310 Shales as above, white anhydrite and moderate reddish orange shale cavings.

4310-4340 Shale, light brown (5YR6/4), waxy, lumpy, brittle, moderate reddish brown and medium gray shale cavings.

4340-4390 Shale, medium gray, platy, brittle some pyrite, moderate reddish orange shale cavings.

4390-4340 Limestone, very light gray, sublithographic, massive, dense.

4340-4440 Missing.

4440-4450 Limestone, pale yellowish brown, fine grainy texture, angular fragments, shale, medium gray, flaky, brittle.

4450-4500 Missing.

4500-4610 Dolomitic limestone, grayish orange pink to light brownish gray, fine grainy texture, subangular fragments, some gray flaky shale cavings.

4610-4620 Limestone, light brownish gray, fine grainy textured, subangular fragments, sparse fossil fragments.

4620-4630 Dolomite, very light gray, microsucrosic, subangular fragments.

4630-4640 Dolomite, as above, fragments of anhydrite, fractures in dolomite filled with anhydrite.

4640-4650 Dolomite, grayish orange pink, very finely crystalline, angular fragments, anhydrite, white, sucrosic.

4650-4700 Dolomite, grayish orange pink, very finely crystalline, semi-angular fragments, shale, brownish gray, long tabular fragments, brittle, from 4680-4700 traces of a lumpy, grayish orange shale.

4700-4740 Limestone, light brownish gray, very finely crystalline, microsucrosic texture, some small fossil shells replaced with calcite. Limestone, medium gray, very finely crystalline, somewhat argillaceous to shaly.

4740-4770 Anhydrite, pale bluish to white, microsucrosic to sucrosic textures.

4770-4790 Shale, medium dark gray, limy, silky luster, platy, brittle, anhydrite as above.

4790-4810 Limestone, pinkish gray, finely crystalline, grainy texture, some fine pinpoint porosity, fragments are subangular, some authigenic calcite.

4810-4890 Limestone, as above, texture is microsucrosic. Microfossils at 4830-4860. Very fine pinpoint porosity.

4890-4920 Limestone, pinkish gray, sublithographic, very dense.

4920-4942 Described under the core chip descriptions.

4942-5000 Limestone, pale yellowish brown, composed of small spherical to elliptical shaped oolites with some scattered porosity between the oolites, much medium gray shale from caving. Poor samples.

5000-5060 Limestone, grayish orange pink (5YR7/2), composed of small irregular to flatten oolites with fair to poor porosity, secondary calcite filling the spaces between the oolites.

5060-5100 Limestone, light gray, some scattered shell fragments, oolitic as above, poor porosity.

5100-5160 Limestone, as above, but little if any porosity texture is more grainy instead of being oolitic.

5160-5270 Limestone, as above, but increasing number of shell fragments, no porosity.

5270-5370 Limestone, as above, fine grained, angular fragments, grainy texture, medium gray shale, from caving. From 5320 to 5360 are brachiopod fragments.

5370-5460 Limestone, pinkish gray to light gray, small spherical oolitic with fine porosity to a finely crystalline texture, fragments are semi-rounded, scattered fossil shell fragments, scattered fragments of dark gray shale.

5460-5560 Limestone, pinkish gray, finely crystalline, subangular fragments, some white, microsucrosic limestone.

5560-5580 Shale, dark gray, platy, compact, some scattered limestone fragments, medium gray, medium grained.

5580-5590 Limestone, pinkish to light gray, very fine grained, angular fragments.

5590-5610 Poor samples.

5610-5630 Limestone, pinkish gray, very fine grained, semi-angular fragments.

5630-5670 Limestone, brownish gray, fine grained, subcrystalline texture, angular fragments, some light gray, platy fragments of shale.

5670-6066 Missing.

6066-6100 Limestone, pinkish gray, microsucrosic, limestone, light gray, fine-grained with ostracode fossils at 6080-6090.

6100-6110 Dolomite, very pale orange, with scattered, well-rounded quartz grains inbedded in the dolomite.

6110-6140 Limestone, pinkish gray, lithographic, subangular fragments.

6140-6160 Shale, light gray, lumpy, compact, some pyrite, scattered fragments of above limestone.

6160-6280 Dolomite, pinkish gray, fine grained, grading to a grainy texture, small angular fragments.

6280-6320 Dolomite, light gray, sublithographic, small semi-angular fragments, dolomite fragments as above.

6320-6380 Shale, light gray with some pyrite to brownish gray, finely foliated, compact, (6330-6370) is missing.

6380-6390 Dolomite, very light gray as above.

6390-6410 Missing.

6410-6420 Dolomite, yellowish gray (5Y7/2), very finely crystalline, microsucrosic, semi-angular fragments.

6420-6450 Limestone, mottled light gray color, very fine grained, finely fossiliferous, small angular fragments, some scattered pyrite.

6450-6480 Shale, medium dark gray, fissile, brittle, scattered limestone, as above.

6480-6520 Limestone, as above, sublithographic, fossil fragments.

6520-6550 Dolomite, very light gray, very finely crystalline, microsucrosic.

6550-6570 Limestone, mottled light gray, very finely crystalline, fossiliferous (Ostracodes); some scattered pore spaces, secondary calcite.

6570-6680 Dolomite, pinkish gray, very finely crystalline, evenly textured, angular fragments, from 6600-6620 some fossil ostracodes. From 6600-6630 some medium dark gray, fissile shale.

6680-6770 Limestone, pinkish gray, very finely crystalline, evenly textured, angular fragments, very finely porous, some fossil ostracodes and shells.

6770-7090 Limestone, as above, but more dense, microsucrosic, more shell fossils, color grading to a very light gray.

7090-7130 Limestone, very light gray, silty shale, moderate red (5R5/4), lumpy, shale, medium gray, platy, brittle, some pyrite.

7130-7180 Sandstone, very fine grained, very light gray, well cemented, composed essentially of very small quartz grains.

7180-7450 Shale, greenish gray (5G6/1), waxy, luster, fractured into thin tabular fragments, brittle, shale is fissile. From 7330 scattered fragments of fine-grained quartzose sandstone with well rounded grains.

7450-7530 Shale, as above, scattered sand grains, fine to medium size, well rounded white to clear quartz.

7530-7560 Shale, as above, scattered fragments of sandstone composed of fine-grained well rounded quartz grains with green glauconitic sand grains among them.

7560-7600 Shale, as above.  
 7600-7740 Sandstone, fine grained, well cemented, glauconitic, composed essentially of quartz, shale as above.  
 7740-7780 Shale, dark greenish gray, waxy luster, fractures into thin, tabular fragments, brittle.  
 7790 Total Depth.

Core Chips Description

3136-3140 Shale, pinkish gray (5YR8/1), dense lumpy, scattered, small siderite nodules, some streaks of iron oxide staining along fracture planes.  
 3162-3179 Argillaceous quartzose fine grained sandstone, loosely cemented, grayish orange pink (5YR7/2) color. The grains are subrounded to subangular, clear quartz.  
 4021-4023 Dolomite, grayish pink (5R8/2) very fine grained, scattered pinpoint porosity, hard and dense.  
 4023-4030 Quartzose fine grained sandstone, pinkish gray (5Y8/1) well cemented, hard.  
 4213-4215 Shale, dark gray, laminated, compact, finely micaceous, dolomite, finely to medium fine crystalline, medium grainy, very hard, has a grainy texture.  
 4215-4218 Dolomite, mottled light gray, very finely crystalline, medium to spongy hardness, dense.  
 4218-4222 Shale, medium gray, massive, slightly calcareous, dense and compact.  
 4450-4455 Limestone, medium gray, highly brecciated, angular fragments surrounded by a matrix of finer fragments, well consolidated and cemented.  
 4455-4476 Anhydrite, white to light gray, very fine grained, dense, massive.  
 4476-4478 Dolomite, light gray, argillaceous, very fine grained, compact, dense, massive.  
 4478-4486 Anhydrite, white to pale blue, very fine grained, dense.  
 4486-4489 Limy dolomite, pale yellowish to dark brown, medium sized rhombic crystals, very dense and compact.  
 4489-4500 Limestone, grayish orange pink (5YR7/2), very fine grained, dense with large dusky yellowish brown rhombic crystals set in thin layers in the finer matrix.  
 4921-4924 Limestone, pale yellowish brown (10YR6/2) very fine grained, fair porosity secondary calcite replacing fossils.  
 4926-4942 Limestone, as above, poor pinpoint porosity, pseudo-oolitic structure, dense.  
 5670-5694 Limestone, pale yellowish brown (10YR6/2) very fine grained, microsugrosic texture, dense.  
 5697-5699 Limestone, as above.  
 5699-5709 Anhydrite, mottled white and pale blue color, very fine grained, dense.  
 5720-5726 Limestone, pale yellowish brown, very fine grained, dense, shows some thin banding.  
 5726-5731 Limestone, as above, but yellowish gray (5Y7/2), and sub-lithographic.  
 5731-5735 Limestone, very pale orange, numerous replaced small fossil shells, scattered pinpoint porosity.  
 5736-5737 Limestone, as above, but little to no porosity.  
 5738-5741 Dolomite, pale yellowish brown, very fine-grained, microsugrosic texture, dense.

5745-5750 Dolomite, greenish gray (5GY6/1) very fine grained and dense, has anhydrite inclusions and fine to medium sized well rounded quartz grains scattered in a thin layer through the dolomite, the dolomite is somewhat shaly.

5750-5756 Limestone, pale yellowish brown, very fine grained, grainy texture, scattered microfossils, very dense and hard, grades into a microsucrosic texture.

5756-5788 Dolomite, pale yellowish brown, very fine grained microsucrosic texture very dense and hard.

5788-5790 Limestone, pale yellowish brown, very fine grained, microsucrosic texture, very dense and hard, some pale bluish gray anhydrite.

5790-5810 Anhydrite, pale bluish gray, dense and very finely crystalline, color grades to pale brown.

5810-5822 Dolomite, pale yellowish brown, very fine grained, microsucrosic texture, hard and dense.

5822-5838 Limestone, pale yellowish brown, very fine grained some microfossils, hard and dense, secondary calcite filling fissures and vugs.

5838-5850 Anhydrite, greenish gray, very fine grained, dense.

5850-5859 Limestone, medium light gray, medium sized grains, grainy texture, dense.

5859-5868 Limestone, yellowish gray (5Y7/2), very finely crystalline, finely fossiliferous, dense and hard.

5868-5874 Dolomite, very pale orange, sublithographic, hard and dense.

5874-5889 Limestone, pale yellowish brown, medium grained, finely fossiliferous, very dense and hard.

5889-5914 Dolomite, bluish white, very fine grained, dense, has anhydrite nodules scattered in the dolomite. At 5911-5914 is some red anhydrite.

5914-5947 Limy shale, grading into limestone, medium gray, finely crystalline microfossils in thin parallel layers, shows a banded structure.

5947-5966 Dolomite, yellowish gray to bluish gray, fine grained, dense, anhydritic.

5966-6000 Limestone, yellowish gray, sublithographic, very dense, all fossils replaced by calcite.

6000-6008 Dolomite, very light gray, very fine grained, dense.

6008-6011 Limestone, very pale yellowish brown, very fine-grained, microsucrosic texture pore openings, hard and dense.

6011-6020 Limestone, as above, but without the pore openings.

6020-6049 Limestone, light olive gray (5Y6/1), sublithographic, dense, scattered fossil fragments.

6049-6066 Sandy dolomite, fine to medium sized well rounded quartz grains scattered in a matrix of finely crystalline, very light gray dolomite.

7788-7790 Quartzose biotite schist, mottled light to dark greenish black, vitreous to splintery luster, highly biotitic, showing good lineation, green mineral scattered throughout (hornblende?), has stringers of calcite filling fractures.