

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 162

A Summary of the Sohio Petroleum Company - Harold Ritter #1
Renville County, North Dakota
Well No. 940 - Permit No. 952

By Clarence Carlson
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Sohio Petroleum Company, Harold Ritter #1, Renville County, North Dakota. Location: C SE NE Section 23, T.163N., R. 86W. Elevation: 1746 G.L., 1757 K.B.

The Sohio Petroleum Company, Harold Ritter #1 was spudded August 13, 1955, was drilled to a total depth of 5,180 feet and completed as an oil well September 25, 1955. The initial production was 374 barrels per day, no water, 28.1 gravity, 70.80 to 1 gas-oil ratio, producing on pump.

Logging record:

Schlumberger electric log, microlaterolog, laterolog, gamma ray-neutron and perforating record.

Coring record: 4509-4565

Testing record:

DST #1 4419-4429, recovered 150 feet of salt water on 1 1/2 hour test. FBHP 9-20#, 30 minute SIP 1980#.

DST #2 4422-4468, 2 hours. Recovered 560 feet of salt water. FBHP 20-380#, 30 minute SIP 1965#.

DST #3 4503-4524, 2 hours. Recovered 3911 feet of free oil, no water. Gas to the surface in 4 minutes. FBHP 125-1145#, 30 minute SIP 1476#.

Casing record:

9 5/8" set at 329 feet with 225 sacks of cement.
7" set at 4638 feet with 250 sacks of cement.

Perforations:

4500-4518. Number of holes 112, acidized with 1000 gallons.

Formation tops were determined from samples and electric logs, corrected to the electric logs. Doubtful or obscure formations 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	745
Niobrara formation	2204
Greenhorn formation	2515
Dakota group	2780
Dakota group sandstones	3048

Jurassic System	3428
Piper limestone	3932
Triassic System	
Spearfish formation	4182
Mississippian System	
Charles formation	4373
Mission Canyon formation	4720
M. C. 2 beds	4887
Lodgepole formation	5074

400-430	Lignite, some shale, light gray to medium gray.
430-460	Shale as above, some sandstone light gray, argillaceous, micaceous.
460-520	Sandstone, light gray, fine grained, micaceous, bentonitic.
520-580	Shale, medium gray to light gray, some sand, loose medium to fine grained, rounded quartz.
580-610	Shale as above, some lignite.
610-640	Sandstone, light gray, fine grained, argillaceous bentonitic, some shale, medium gray bentonitic.
640-670	Siltstone, light gray, argillaceous, bentonitic.
670-700	Shale, pale brown and light gray, silty, bentonitic.
700-730	Sandstone, light gray, fine grained, micaceous, calcareous.
730-820	Shale, medium gray and pale brown, micaceous, bentonitic.
820-940	Shale, medium light gray, bentonitic, micaceous.
940-1060	Shale, light gray, lumpy, compact.
1060-1180	Shale, medium light gray to medium gray, bentonitic.
1180-1630	Shale, medium light gray, lumpy.
1630-1990	Shale, light gray, lumpy, compact.
1990-2080	Shale, medium gray to medium dark gray, fissile.
2080-2170	Shale, medium light gray, and medium dark gray, platy.
2170-2200	Shale, medium dark gray, flaky, calcareous, white specks.
2230-2260	Shale, medium gray, and medium dark gray, flaky and lumpy, compact.
2290-2500	Shale, medium dark gray, flaky and platy.
2500-2510	Shale, medium dark gray, flaky, calcareous, white specks, many Inoceramus fragments.
2530-2540	Shale, medium dark gray and medium light gray, flaky and platy.
2540-2560	Shale, medium dark gray, flaky to platy, calcareous, white specks, many Inoceramus fragments.
2570-2600	Shale, medium gray and medium dark gray, platy, compact.
2600-3010	Shale, medium dark gray, flaky to platy.
3010-3040	Shale as above, some sandstone, colorless to very light gray, fine grained; some loose, medium, rounded quartz grains.
3040-3070	Sandstone, colorless, fine to medium, rounded to subangular, quartz, a little pyrite cement, some sandstone, very light gray, fine grained; some shale, very light gray, soft, flaky.
3110-3130	Sandstone, colorless, fine grained, subangular quartz, shale, light gray to medium light gray, soft, flaky.
3130-3210	Sandstone, colorless, fine to medium grained, subangular with a little pyrite cement, shale as above.
3210-3310	Shale, light gray to medium light gray, soft, flaky, some sandstone as above.

3310-3330 Sandstone, colorless to white, fine grained, subangular quartz grains; shale, light gray to medium light gray, soft, flaky.

3330-3400 Sandstone, colorless, fine to medium, rounded to subangular quartz; shale as above.

3400-3450 Shale, light gray to light olive gray, flaky to platy, soft, calcareous.

3450-3460 Shale, light olive gray and pale brown, platy to flaky, calcareous; some sandstone, very light gray, very fine to fine grained, calcareous.

3460-3520 Shale, grayish red and light greenish gray, platy, slightly calcareous.

3520-3580 Shale, greenish gray, 5GY6/1, slightly calcareous; some sandstone very light gray, fine grained, calcareous.

3580-3720 Shale, greenish gray, platy, slightly calcareous.

3720-3760 Shale, greenish gray, and pale brown, platy, slightly calcareous.

3760-3770 Shale as above with a little limestone white to very light gray, fine grained.

3770-3780 Sandstone, grayish orange, fine grained, very slightly calcareous, some shale as above.

3780-3790 Dolomite, grayish orange, fine grained silty; some sandstone as above, some shale as above.

3790-3800 Shale, medium dark gray, pale brown and greenish gray, platy.

3800-3810 Shale, light greenish gray, pale reddish brown, splintery, slightly calcareous; a little sandstone, grayish orange, fine grained, slightly calcareous.

3810-3830 Sandstone, light gray, fine grained, slightly calcareous, some shale as above.

3830-3840 Shale, greenish gray, pale reddish brown, splintery, slightly calcareous.

3850-3870 Shale, as above.

3870-3890 Shale as above, some sandstone, light gray, fine grained, calcareous.

3890-3900 Sandstone, grayish orange, fine grained, calcareous, some shale as above.

3900-3930 Shale, as above.

3930-3960 Limestone, light gray, fine grained, with some light gray, chert.

3960-4020 Limestone, very light gray to white, fine grained to finely crystalline.

4020-4050 Limestone as above, with a little chert, very light gray.

4050-4060 Shale, medium gray and pale brown; with a little gypsum.

4060-4070 Limestone, very light gray, fine grained, with some chert and a little gypsum.

4070-4090 Shale, pale reddish brown, platy, compact, calcareous and medium light gray, platy, compact, slightly calcareous.

4090-4110 Shale as above, with a little white anhydrite.

4110-4130 Shale as above, a little anhydrite, white and dolomite, light yellowish gray, very fine grained.

4130-4160 Shale, medium light gray and pale reddish brown, platy, slightly calcareous, a little white anhydrite.

4160-4180 Shale and anhydrite as above.

4180-4190 Shale, pale brown, lumpy, slightly calcareous with a little gypsum.

4190-4290 Siltstone, moderate reddish orange, with some medium grained quartz grains; slightly calcareous; some anhydrite, white.

4310-4330 Siltstone, moderate reddish orange, with some sand grains, medium rounded grains.

4330-4370 Siltstone as above, becoming very sandy.

4370-4380 Siltstone as above; some anhydrite, white to pinkish gray.

4380-4390 Anhydrite, white to pinkish gray.

4390-4400 Limestone, grayish orange pink, fine grained, granular, anhydritic; some anhydrite as above.

4400-4420 Anhydrite, light gray to pinkish gray, dense slightly calcareous.

4420-4430 Limestone yellowish gray, fine grained, granular, with some anhydrite fillings.

4430-4440 Dolomite, light brownish gray, microsucrosic, some oil stained, good cut with Ccl_4 ; Limestone as above.

4440-4450 Limestone, yellowish gray, fine grained, granular, a few pieces are oolitic, a few pieces are oil stained and cut with Ccl_4 .

4450-4468 Limestone, yellowish gray, fine grained, granular, oolitic in part, slightly anhydritic.

4480-4490 Limestone, fine grained, fragmental to finely crystalline, slightly anhydritic; some anhydrite, white, dense.

4500-4510 Limestone, very light gray; fine grained, fair to good intergranular porosity, a little vuggy porosity; scattered oil stain and cut with Ccl_4 .

CORES

4509-4510 Limestone, very light gray, oolitic, mostly recrystallized to very finely crystalline, vuggy with many of the vugs filled with colorless anhydrite; scattered oil stain.

4513-4515 Limestone, light brownish gray, oolitic to pisolitic, partly recrystallized to very finely crystalline, vuggy, oil stained.

4515-4517 Limestone, yellowish gray, oolitic to pisolitic, with colorless anhydrite filling pores and vugs; some oil stain.

4517-4523 Dolomite, light gray, very fine grained, silty.

4523-4525 Limestone, yellowish gray, oolitic to pisolitic, with colorless anhydrite filling the pores and vugs, a little pyrite, scattered stain.

4525-4526 Limestone, very light gray, finely crystalline, slightly vuggy with the vugs filled by anhydrite.

4526-4527 Limestone as above, with vertical fractures, with staining along the fractures.

4527-4528 Limestone, yellowish gray, oolitic to pisolitic, mostly recrystallized to finely crystalline, vuggy, with good staining in the vugs, some anhydrite filling of vugs.

4528-4534 Limestone as above, no staining, anhydrite filling vugs and fractures.

4534-4549 Limestone, yellowish gray, oolitic to pisolitic, mostly recrystallized to finely crystalline, vuggy, vugs filled with colorless anhydrite; oil stained (34-35).

4549-4554 Limestone, yellowish gray, oolitic, mostly recrystallized to finely crystalline, vuggy with little, filling of the vugs by anhydrite.

4554-4565 Limestone as above with more filling of vugs and fractures by anhydrite.

SAMPLES

4565-4580 Limestone, yellowish gray, finely crystalline, slightly anhydritic; some oolitic with the pores filled with colorless anhydrite.

4590-4630 Limestone, yellowish gray to very light gray, finely crystalline to oolitic, anhydritic.

4630-4680 Limestone, light yellowish gray, fine grained to finely crystalline, oolitic in part.

4680-4690 Limestone, very light gray, fine to medium grained, granular, silty to fine grained, sandy.

4690-4700 Limestone, yellowish gray, finely crystalline to fine grained, some limestone as above.

4700-4770 Limestone, yellowish gray, fine grained to finely crystalline with some secondary anhydrite.

4770-4800 Limestone, light yellowish gray, fine to medium grained, granular to fragmental.

4800-4890 Limestone, light yellowish gray, fine grained, grainy and fragmental.

4890-4940 Limestone, yellowish gray to very light brownish gray, micro-sucrosic, dolomitic.

4940-4950 Limestone, very light gray, very fine grained, chalky, some limestone as above.

4950-4970 Limestone, light yellowish gray, oolitic to granular, fine grained.

4970-4980 Limestone, light brownish gray, microsucrosic, slightly dolomitic and limestone, light yellowish gray, fine to medium grained, fragmental.

4980-5060 Limestone, light brownish gray, as above with a few shell fragments.

5060-5080 Limestone, very light gray to light brownish gray, fine grained; some chert, very light gray.

5080-5100 Limestone, light brownish gray, fine grained to medium grained, fragmental.

5100-5180 Limestone, light gray to light brownish gray, fine to medium grained, fragmental.