

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 254

Summary of the Vern Lund - N. Gullickson No. 1
Burke County, North Dakota
Well No. 2158 - Permit No. 2170

by Clarence G. Carlson
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The Vern Lund - N. Gullickson No. 1 well is located in the C SW SW of Section 8, T. 161N., R. 91W., Burke County, North Dakota. Elevations: 2068 G.L.; 2078 K.B.

The Vern Lund - N. Gullickson No. 1 well was spudded January 14, 1959, drilled to a total depth of 6,753 feet and completed as the discovery well of the Northeast Foothills field February 21, 1959.

Logs Run:

Laterolog - Gamma Ray
Sonic
Microlaterolog

Core Record: 6602-6652

Tests:

DST 1; 6624 to 6652; tool open 4 hours; gas to surface in 6 minutes. Recovered 810 feet of oily mud emulsion, 2,470 feet of free oil, no water. Pressures: ISIP (60 minutes) 2968 FSIP (90 minutes) 2840, FP 107-636, HP 3796-3738 casing and completion:

Set 10 3/4 inch surface casing at 535 feet with 300 sacks of cement.
Set 5 1/2 inch casing at 6,753 feet with 400 sacks of cement.
Perforated the interval from 6631 to 6647 with 4 shots per foot; acidized with 1,500 gallons. Initial potential, 115 barrels of oil in 12 hours through 16/64 inch choke, 42° API.

Formation tops were determined from samples and mechanical logs; tops were corrected to Laterolog-Gamma Ray tops. Colors were determined by use of the Rock Color Chart distributed by the Geological Society of America. Not all formation tops were picked in the following list.

FORMATION TOPS

Cretaceous System	
Pierre formation	1428
Niobrara formation	3385?
Greenhorn formation	3740
Mowry formation	4016
Fall River formation	4350
Jurassic System	4662
Rierdon formation	5062
Piper limestone	5395
Triassic System	
Spearfish formation	5636

Mississippian System

Kibbey limestone	6003
Madison group	6170
Poplar interval	6170
Ratcliffe interval	6450
Frobisher-Alida interval	6634

0-30	A little gravel; some lignite; same siltstone, very light brownish gray.
30-60	Sandstone, very light gray, very fine to fine grained, calcareous; siltstone, as above; some lignite.
60-210	Lignite; some shale, medium light gray, fissile to platy; some siltstone, very light brownish gray.
210-240	Siltstone, light gray, bentonitic; a little lignite.
240-270	Shale, very light gray, lumpy, bentonitic.
270-360	Shale, as above; same siltstone, very light gray, bentonitic.
360-390	Sandstone, very light gray, very fine to medium grained, sub-angular, silty, bentonitic.
390-560	Shale, very light gray, lumpy, bentonitic; a little siltstone, very light gray, bentonitic.
560-680	Lignite.
680-860	Lignite; much loose quartz grains, rounded to angular, fine to medium and coarse grained.
860-980	Sandstone, very light gray, very fine to fine grained, argillaceous, very calcareous.
980-1340	Siltstone, very light gray, bentonitic; shale, very light gray, silty, bentonitic, soft.
1340-1520	Shale, very light gray, lumpy; some siltstone, as above.
1520-1640	Shale, medium light gray, lumpy, bentonitic.
1670-1760	Shale, medium light gray to medium gray, soft, lumpy, bentonitic.
1790-1820	Shale, as above.
1820-1940	Shale, medium light gray, lumpy, compact.
1940-2120	Shale, medium light gray, lumpy, compact in part, lumpy, soft, bentonitic in part.
2150-2510	Shale, medium light gray, soft, lumpy, bentonitic.
2510-2840	Shale, medium light gray to medium gray, soft, lumpy, bentonitic.
2840-3410	Shale, medium gray, lumpy to fissile and platy.
3410-3440	Shale, medium dark gray, platy, compact, calcareous, contains "white specks".
3440-3470	Shale, medium dark gray, fissile to platy, compact; some calcareous shale, as above.
3470-3650	Shale, medium dark gray to medium gray, platy to fissile, compact, calcareous, contains "white specks".
3650-3770	Shale, medium dark gray, fissile.
3770-3800	Shale, as above; some shale, medium dark gray, fissile to platy, calcareous, contains "white specks".
3800-3950	Shale, medium dark gray, platy to fissile, calcareous, contains "white specks"; many Inocaramus fragments.
3950-4370	Shale, medium dark gray, fissile.
4370-4400	Sandstone, white to very light gray, very fine to fine grained, argillaceous.
4400-4430	Sandstone, colorless, very fine to medium grained, subangular, clean, quartzose; some sandstone as above.
4430-4490	Shale, medium gray, platy, silty interbedded with siltstone, very light gray.

4490-4660 Sandstone, colorless to very light gray, very fine to fine grained, subangular to subrounded, some grayish orange siderite nodules.

4660-4690 Sandstone, as above; siderite nodules as above; some loose, medium to coarse, subangular to subrounded quartz grains.

4690-4700 Shale, medium grey, soft, fissile to platy.

4700-4730 Shale, as above; traces of shale, very light gray to pinkish gray, soft, flaky, greasy.

4730-4800 Some shale, light olive gray, pale reddish brown, very light gray, soft flaky, greasy; much shale, medium dark gray, as above.

4800-4840 Shale, greenish gray, 5GY6/1, fissile, very slightly calcareous; some sandstone, very light gray, very fine grained, argillaceous, calcareous.

4840-4850 Sandstone, white to very light gray, very fine grained, calcareous argillaceous; some shale, as above.

4850-4870 Sandstone, white to very light gray, very fine grained, calcareous.

4870-4890 Sandstone, as above; some shale, greenish gray fissile, calcareous.

4890-4900 Shale, greenish gray, fissile, calcareous; some sandstone, as above.

4900-4920 Sandstone, white to very light gray, very fine to fine grained, calcareous; some shale, as above.

4920-4930 Limestone, very light gray, fine to medium crystalline, fragmental; shale, greenish gray, fissile, calcareous.

4930-4960 Shale, greenish gray, fissile, calcareous.

4960-5040 Shale, light olive gray to greenish gray, platy to fissile, slightly calcareous.

5040-5180 Shale, light greenish gray to greenish gray, platy to fissile, very calcareous.

5180-5280 Shale, light greenish gray and pale brown, platy, calcareous.

5280-5310 Shale, light greenish gray, platy to fissile, calcareous, some sandstone, light greenish gray, very fine grained, calcareous.

5310-5320 Limestone, yellowish gray, very finely crystalline, dense; some shale and sandstone, as above.

5320-5330 Limestone, yellowish gray to light gray, finely crystalline, fragmental.

5330-5340 Limestone, as above; sandstone, very light brownish gray, very fine to fine grained, clean, quartzose, subangular grains, calcareous cement.

5340-5360 Shale, greenish gray, pale reddish brown, platy to fissile, calcareous.

5360-5380 Shale, as above; a little sandstone, very light brownish gray, very fine to fine grained, argillaceous, calcareous.

5380-5400 Limestone, very light gray, fine grained, fragmental, argillaceous, some shale, as above.

5400-5410 Limestone, as above; some white to colorless chert.

5410-5420 Limestone, as above and limestone, very light brownish gray, oolitic to pisolitic, finely crystalline.

5420-5430 Shale, greenish gray, platy to fissile, calcareous.

5430-5450 Limestone, light yellowish gray, finely crystalline, earthy; some colorless to very light gray chert.

5450-5490 Limestone, medium light gray, very finely crystalline, slightly argillaceous; some shale, greenish gray, platy to fissile calcareous.

5490-5520 Shale, medium gray, lumpy to platy, very slightly calcareous; some limestone, as above.

5520-5530 Limestone, very light gray, very finely crystalline, dense.

5550-5600 Shale, pale reddish brown, platy, calcareous; some greenish gray and medium gray shale; traces of limestone, very light gray, finely crystalline; traces of white anhydrite.

5600-5650 Anhydrite, white; much shale, as above.

5650-5790 Siltstone, moderate reddish orange, slightly calcareous.

5790-5920 Siltstone, as above; some siltstone is very sandy with fine to medium rounded quartz grains.

5920-5930 Siltstone, as above; a little shale, pale reddish brown, platy to fissile, calcareous.

5935-5940 Siltstone, moderate reddish orange, slightly calcareous, sandy; some shale, as above.

5940-5950 Siltstone, as above.

5950-5995 Siltstone, as above; some sandstone, grayish orange pink, very fine to medium grained, well rounded, frosted, silty, slightly calcareous.

5995-6010 Sandstone, pale red, very fine to medium grained, slity, calcareous; siltstone, as above.

6010-6025 Limestone, grayish pink 5R8/2 to pale red 5R6/2, fine to medium, crystalline.

6025-6035 Limestone, yellowish gray, finely crystalline, fragmental in part, oolitic in part.

6035-6040 Limestone, as above; some sandstone, grayish pink, very fine to medium grained, rounded to subangular, calcareous.

6040-6050 Siltstone, pale red, calcareous.

6100-6160 Siltstone, moderate reddish orange, sandy, calcareous.

6160-6165 Limestone, grayish pink, finely crystalline, silty; siltstone, as above.

6165-6175 Dolomite, grayish pink, fine to medium crystalline.

6175-6195 Anhydrite, white; much siltstone, moderate reddish orange, sandy, calcareous.

6195-6200 Limestone, grayish pink, fine to medium crystalline, silty, dolomitic.

6200-6215 Limestone, as above; some anhydrite, white to pinkish gray.

6215-6220 Anhydrite, white to pinkish gray; traces of limestone, pinkish gray to light gray, finely crystalline.

6220-6225 Limestone, grayish pink to pale red, finely crystalline, fragmental.

6225-6230 Limestone, as above; some anhydrite, white.

6230-6235 Anhydrite, white to pinkish gray; some limestone, as above.

6235-6265 Dolomite, grayish pink to moderate pink, fine grained, granular, slightly argillaceous limy.

6265-6270 Anhydrite, light gray, dense, limy.

6270-6275 Anhydrite, white to very light gray, dense.

6275-6280 Limestone, yellowish gray to very light brownish gray, fine grained, fragmental in part, granular in part.

6280-6295 Limestone, very light brownish gray, pelletoidal, fragmental.

6295-6310 Limestone, very light brownish gray, fragmental, with a finely crystalline matrix in part, finely crystalline in part.

6310-6315 Limestone, as above; some anhydrite, white to very light gray.

6315-6325 Anhydrite, very light gray, limy to white anhydrite.

6325-6335 Anhydrite, white.

6335-6360 Anhydrite, as above; some limestone, very light brownish gray, oolitic to fragmental.

6360-6365 Mostly dark gray shale cavings; traces of limestone, light brownish gray, fine grained, fragmental.

6365-6375 Limestone, very light brownish gray to yellowish gray, fragmental in part, finely crystalline in part.

6375-6380 Anhydrite, white; some limestone, as above.

6380-6390 Anhydrite, white to very light gray, limy.

6390-6415 Limestone, very light brownish gray to light brownish gray, very finely crystalline, dense in part, fragmental with a finely crystalline matrix in part.

6415-6420 Limestone, light gray, very finely crystalline, dense.

6420-6430 Sandstone, very light gray, very fine to fine grained, rounded, frosted, calcareous cemented; some limestone, very light brownish gray, finely crystalline to fine grained, fragmental.

6430-6435 A little anhydrite, white; some limestone, as above.

6435-6440 Anhydrite, white to very light gray.

6440-6450 Anhydrite, white to very light gray; some limestone, very light brownish gray, oolitic to pelletoidal, fragmental.

6450-6465 Limestone, very light brownish gray, pelletoidal, good intergranular porosity.

6465-6470 Limestone, very light brownish gray, finely crystalline to fine grained, granular.

6470-6495 Limestone, very light brownish gray, fragmental in part, finely crystalline in part; some anhydrite, white.

6495-6500 Anhydrite, white to very light gray; some limestone, as above.

6500-6510 Limestone, very light brownish gray, finely crystalline, fragmental.

6510-6525 Anhydrite, white to very light gray; some limestone, as above.

6525-6530 Limestone, very light brownish gray, pelletoidal, fragmental with a finely crystalline matrix.

6530-6535 Limestone, light brownish gray to brownish gray, very fine to finely crystalline, dense; some limestone, as above.

6535-6545 Limestone, very light brownish gray, fragmental with a finely crystalline matrix.

6545-6550 Limestone, as above; some anhydrite, very light gray to white.

6550-6565 Anhydrite, very light gray; some limestone, as above.

6565-6570 Limestone, very light brownish gray, fragmental with a finely crystalline matrix.

6570-6580 Limestone, very light brownish gray, fine grained, granular pinpoint porosity; some fragmental limestone, as above.

6580-6595 Anhydrite, white to very light gray; some limestone, as above.

6595-6600 Limestone, medium light gray, finely crystalline, slightly argillaceous.

Cores

6620-6606 Dolomite, very light brownish gray, fine to medium crystalline, limy, granular, pinpoint porosity, good oil stain.

6606-6614 Dolomite, very light brownish gray, fine to medium crystalline, granular, limy, good pinpoint porosity slightly argillaceous with spotty staining and cut with Ccl_4 .

6614-6618 Dolomite, very light brownish gray to very light gray, fine to medium crystalline, granular, limy, good pinpoint porosity, slightly argillaceous.

- 6618-6620 Limestone, very light brownish gray, fine to medium crystalline, a few brachiopod fragments, granular, slightly argillaceous.
- 6620-6621 Limestone, very light brownish gray, fine to medium crystalline, fragmental fossiliferous, slightly argillaceous.
- 6621-6622 Limestone, medium light gray, finely crystalline, very argillaceous.
- 6622-6625 Limestone, medium light gray to very light brownish gray, fine to medium crystalline, fossiliferous, fragmental argillaceous.
- 6625-6630 Limestone, very light brownish gray, fine to medium crystalline, granular, some shell fragments, slightly argillaceous, fair oil stain and cut with Ccl_4 .
- 6630-6634 Limestone, very light brownish gray, oolitic to pisolitic with a finely crystalline matrix, good oil stain, some vuggy porosity, some infilling with colorless anhydrite.
- 6634-6640 Limestone, light brownish gray, oolitic to pisolitic, partially recrystallized to a very finely crystalline texture, some anhydrite infilling of vugs and pores.
- 6640-6642 Limestone, light brownish gray, oolitic to pisolitic, mostly recrystallized to a very finely crystalline limestone, colorless anhydrite has infilled vugs and fractures.
- 6642-6644 Limestone, as above, partially replaced by colorless to white anhydrite.
- 6644-6645 Anhydrite, white; a little limestone, light brownish gray, very finely crystalline.
- 6645-6647 Limestone, light brownish gray, oolitic to pisolitic, partially replaced by white anhydrite.