

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 138

Summary of the Lion Oil Co. - Peter P. Nelson #1  
Rolette County, North Dakota  
Well No. 917 - Permit No. 929

By Dan E. Hansen  
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The Lion Oil Co. - Nelson #1, Rolette County, North Dakota. Location is 505 from east line, NE SE Section 22, T. 160N., R. 72W. Elevation 1602 K.B., 1591 G.L.

The Lion Oil Co. - Nelson #1 was spudded July 11, 1955, drilled to a total depth of 3155 feet, ending in the Nisku formation, and was plugged July 22, 1955.

Cored Intervals: 2609-2658; 2658-2700; 2700-2778; and 2778-2818.

Drill Stem Tests: DST #1 2335-2360, open 1 1/2 hours. Recovered 175' HWCM.  
FPO - 0, SIP - 30 min. 900#.

Logs Run: Electric, radiation, microlaterolog.

Casing Record:	Size	Put in Well	Left in Well	Sacks of Cement
	8 5/8"	275	275	125

Plugging Record:

- 15 sacks cement from 3050-2997
- 15 sacks cement from 1956-1912
- 15 sacks cement from 1824-1771
- 15 sacks cement from 287-234
- 10 sacks at top of surface

Formation tops were determined from samples and electric log and corrected to the electric log. Not all formation tops were picked. Colors were determined from the rock color chart.

Cretaceous System

Niobrara Formation	1004
Greenhorn Formation	1443
Dakota Group	1673
Dakota Group Sand	1826

Jurassic System 2162

    Piper Lime 2369

Triassic System

    Spearfish Formation 2546

Mississippian System

    Lodgepole Formation 2605

    Englewood Formation 3060

Devonian System

    Nisku Formation 3093

0-70 Gravel and sand, mainly angular quartz grains with feldspar fragments and yellow-brown dolomite.

70-190 Silt, sand, gravel, gray silt, calcareous. Sand and gravel as above.

190-420 Shale, medium gray, massive, compact to lumpy, silty, bentonitic. Traces medium dark gray, soft flaky shale.

420-960 Shale, medium gray, compact, massive to flaky, micro-micaceous.

960-1040 Shale as above, with medium dark gray, flaky, soft, spongy shale, light gray bentonite.

1040-1140 Shale, medium dark gray, massive, calcareous, "white specks", compact, becoming medium gray and more calcareous 1080-1140. Traces calcite prisms, shell fragments.

1140-1440 Shale, medium dark gray, soft, spongy, massive. Traces light greenish gray bentonite. Traces fine grained, calcareous, light brown, sandstone, quartzose at 1240-1260. Also traces gray brown limestone.

1440-1580 Shale, medium dark gray, massive, compact, calcareous, "white specks". Calcite prisms. Globigerina.

1580-1720 Shale, medium dark gray to dark gray, soft, flaky to massive, spongy.

1720-1760 Shale, medium gray, as above.

1760-1840 Shale, medium dark gray, dark gray as above.

1840-1900 Sand, light gray, fine grained, some pyrite cemented, quartzose, with traces medium - coarse grained, angular - subrounded white, clear, pitted, loose quartz grains. Circulation at 1845. Traces red brown shale, pink gypsum. Circulation at 1870-1880 and at 1885.

1900-2000 Sand, small amounts loose, medium - coarse grained, angular sub-rounded quartz grains, Much medium gray shale. White - pink gypsum and light brown gray shale. Trace light gray sandy limestone at 1880-1890.

2000-2080 Shale, light gray to medium gray, soft, spongy, with traces of anhydrite and calcareous fine grained, white, light brown sandstones. Small amounts dark gray, flaky shale.

2080-2100 Sand, loose medium - coarse grained angular - subrounded quartz grains in small amounts. Much white - pink gypsum, traces light greenish gray soft shale and light gray, fine grained, gypsum cemented quartzose sandstone.

2100-2110 Sand, very fine grained, calcareous cement, white, quartzose. With light gray greenish gray, flaky, spongy shale and traces of red brown shale. Gypsum as above.

2110-2170 Shale, light gray greenish gray and dark gray as above. Gypsum as above.

2170-2210 Shale as above, plus light red brown shale, calcareous. Gypsum, as above. Traces white, light brown fine grained quartzose sandstone.

2210-2240 Limestone, white pinkish gray, very fine grained, sublithographic dense. With shale and sand as above.

2240-2300 Shale, light greenish gray, brown red, compact, splintery, slightly calcareous. Loose, fine grained, clear quartz grains.

2300-2340 Sandstone, fine medium grained, white, angular - subrounded quartz grains cemented by gypsum. Much gypsum and loose quartz grains. Shale as above.

2340-2370 Limestone, white - pinkish gray, dense, sublithographic to chalky, red brown shales and shales as above.

2370-2380 Limestone, light gray, fine grained, dense, shale streaked.  
 2380-2445 Limestone, very light gray, very fine grained to sublithographic, dense.  
 2445-2455 Shale, red brown, silty, calcareous, and white, fine - medium grained, rounded quartzose sandstone, calcareous cement.  
 2455-2470 Limestone and gypsum, white very light gray, fine grained. Some medium grained, rounded quartz grains.  
 2470-2525 Anhydrite, white, coarse crystalline and reddish brown, brownish gray, silty, calcareous shale.  
 2525-2550 Anhydrite, white, coarse crystalline, with light gray shale.  
 2550-2575 Shale and silt, reddish brown, calcareous, lumpy, massive with traces of rounded, frosted, medium grained quartz.  
 2575-2600 Silt, moderate pink, grading into an anhydrite cemented very fine grained sandstone. Shale, silt, and loose quartz grains as above.  
 2600-2609 Limestone, dolomitic, pale red, fine medium grained, crystalline and partially fragmental. Inclusions of anhydrite.

Core #1

2609-2035½ Limestone, light brownish gray, fragmental, fine medium grained, with some coarse grained (brachiopod shell fragments). Much recrystallization and cementation to poor porosity. Anhydrite inclusions.  
 2035½-2037 Limestone, light brownish gray, fragmental, very coarse grained, some vuggy porosity.  
 2637-2640 Limestone, pale red-brownish-gray, fine grained, fragmental.  
 2640-2644½ Limestone, fine-medium grained, fragmental with some coarse grained. Light brownish gray. Recrystallization and some intergranular porosity. Few red shale streaks.  
 2644½-2647 Core samples missing.  
 2647-2648 Limestone, pale red, fine-medium grained, fragmental to granular.  
 2648-2650 Limestone as above, and coarse grained, fragmental, slightly oolitic, recrystallized, yellowish gray limestone.  
 2650-2655 Limestone, pinkish gray, medium-coarse grained, fragmental and granular. Intergranular porosity, with streaks of fine grained, dense, light brownish gray, shaly limestone.  
 2655-2656 Limestone, yellowish gray, fine grained, granular, with red-brown and gray color bands.  
 2656-2658 Limestone, grayish-pale-red, medium to very coarse grained fragmental and crystalline. Many brachiopod fragments.

Core #2

2658-2661 Limestone, as above.  
 2661-2665 Limestone, grayish-pale-red, fine-medium grained, fragmental and crystalline. Few shell fragments.  
 2665-2671 Limestone, grayish-pale red, very coarse grained, fragmental, oolitic and crystalline. Many shell fragments. Porosity high, intergranular, with low permeability (by cementation). The reddish stain is generally on the oolites.  
 2671-2673 Limestone, fine grained, light brownish gray and yellowish brown color banding, crystalline and fragmental.  
 2673-2675 Limestone, grayish-pale-red, medium-coarse grained, fragmental, oolitic, and crystalline. Shell fragments.  
 2675-2688 Limestone, grayish red and brownish gray, fragmental and crystalline, fine grained.

2688-2691 Limestone, pale red, fine-medium grained fragmental and crystalline. Some pinpoint porosity.

2691-2693 Limestone, brownish gray, fragmental, very coarse grained with much shale and fragments of red-brown shale. Distorted bedding, fossiliferous.

2693-2694 Limestone, pale red, coarse grained, fragmental, fine grained, crystalline, sucrosic.

2694-2696 Limestone, grayish pale-red, medium-coarse grained, fragmental, oolitic.

2696-2700 Limestone, grayish pale-red, medium-very coarse grained, fragmental, oolitic and shell fragments.

End of Core

2700-2740 Limestone and shale, grayish-pale red limestone as above, and medium gray, calcareous, very flaky shale.

2740-2750 Limestone, yellowish gray, fragmental, oolitic, medium-coarse grained, shaly. Many shell fragments.

2750-2770 Limestone, gray-yellowish-gray, fragmental, angular, medium-very coarse grained. Many shell fragments, shaly.

Core #3

2770-2778 Limestone, light gray, fine-medium grained, fragmental and crystalline. Shell fragments, some pinpoint porosity.

2778-2883 Core missing.

2883-2887 Limestone, light gray, fine-very coarse grained, fragmental and crystalline, grainy to subcrystalline. Much shell fragments. Gray shale banding.

2887-2794 Core missing.

2794-2795 Limestone, light gray, as above.

2795-2800 Core missing.

2800-2811 Limestone, light gray, as above.

2811-2818 Core missing. Samples missing.

End of Core.

2818-2860 Limestone, light gray, fine-coarse grained, fragmental, angular to crystalline, shaly. Many brachiopod shell fragments. Circulation at 2860.

2860-2905 Limestone, light gray, fine-medium grained, subcrystalline to grainy. Few pieces of shell fragments, shaly. Traces of gray chert.

2905-2980 Limestone, light gray, fine grained, crystalline, grainyy, shaly. moderate amount of light gray chert. Traces fragmental, coarse grained, light gray limestone.

2980-3060 Limestone, light gray, fine grained, crystalline, grainy, dense, some shaly. Much light gray, chert.

3060-3095 Shale, dark gray, flaky, calcareous.

3095-3120 Limestone, dolomitic, yellowish gray, fine grained, granular.

3120-3155 Dolomite, light brownish gray, fine-medium grained, granular, vuggy porosity. Some anhydrite filling.

3155 Total depth, samples.