

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 30

Summary of the Phillips Petroleum Company Olivia Saude #1
Pierce County, North Dakota

By Morton Strassberg
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Phillips Petroleum Company - Olivia Saude No.1, Pierce County, North Dakota, NW 1/4 SE 1/4 Section 19, T. 158N. R. 74W. (1980 feet from S. line and 1980 feet from E. line) Elevation: K.B. 1487, G.L. 1476.

The Phillips Petroleum Co. - Olivia Saude No. 1 was spudded February 2, 1953 and 8 5/8 casing was set at 294 feet R.K.B.

The drilling was completed February 28, 1953 and the well was abandoned. Total Depth 3361 feet. Cement plugs were set at the following places:

2936 - 2856 with 25 sacks.
1970 - 1878 with 25 sacks.
316 - 224 with 25 sacks.
Surface with 5 sacks.

The following cores were taken:

Core #1	2600-2650	Core #10	2971-3016
Core #2	2650-2692	Core #11	3016-3066
Core #3	2692-2727	Core #12	3066-3116
Core #4	2727-2742	Core #13	3116-3166
Core #5	2742-2792	Core #14	3166-3216
Core #6	2792-2820	Core #15	3216-3248
Core #7	2820-2870	Core #16	3248-3276
Core #8	2870-2920	Core #17	3276-3311
Core #9	2920-2970	Core #18	3311-3361

Formation tops were determined from samples, electric log, micro log, and cores, not all lithologic tops called in following list. Colors determined from rock color chart.

	<u>TOPS</u>
Cretaceous System	<u>Depth</u>
Niobrara Formation	1147
Greenhorn Formation	1546
Muddy	1829
Dakota	1972
Jurassic System	
Morrison Formation	2210
Sundance Formation	2267
Piper Formation	2560
Triassic System	
Spearfish Formation	2804
Mississippian System	
Charles Formation	2936
Mission Canyon Formation	2963
Lodgepole Formation	3074

<u>From</u>	<u>To</u>	<u>Formation</u>
330	360	Shale, medium light gray.
360	390	Shale, medium light gray, white bentonite.
390	420	Shale, medium light gray, micaceous.
420	660	Shale, medium light gray.
660	690	Shale, medium light gray, bentonitic.
690	750	Shale, medium light gray.
750	810	Shale, medium light and little light olive gray.
810	840	Shale, medium light gray. Little olive gray fine grained dolomite.
840	870	Shale, medium light gray, bentonitic.
870	900	Shale, medium light to medium gray.
900	930	Shale, medium light gray.
930	990	Shale, medium light gray, bentonitic.
990	1050	Shale, medium dark to dark gray.
1050	1080	Shale, medium dark to dark gray, white specks.
1080	1110	Shale, medium dark gray.
1110	1140	Shale, medium dark gray, bentonitic.
1140	1200	Shale, medium dark gray, white specks.
1200	1230	Shale, medium to medium dark gray, white specks, bentonitic.
1230	1260	Shale, medium light gray, white specks, bentonitic.
1260	1320	Shale, medium light gray, bentonitic.
1320	1380	Shale, medium light to medium gray, calcareous.
1380	1410	Shale as above, white specks.
1410	1440	Shale, medium to medium dark gray, calcareous, white specks.
1440	1520	Shale, medium to medium dark gray, calcareous.
1520	1540	Shale, medium to medium dark gray, calcareous, inoceramus fragments.
1540	1560	Shale, medium dark gray, highly calcareous, inoceramus fragments.
1560	1600	Shale, medium to medium dark gray, white specks, calcareous.
1600	1620	Shale, medium light to medium gray, highly calcareous.
1620	1640	Limestone, light to medium gray, argillaceous. Medium dark gray shale.
1640	1680	Limestone as above, considerable inoceramus fragments.
1680	1760	Shale, medium dark gray, calcareous, light to medium gray argillaceous limestone.
1760	1800	Shale, medium dark gray, calcareous, little medium gray argillaceous limestone.
1800	1820	Shale, light to medium dark gray, partially calcareous.
1820	1900	Shale, medium to medium dark gray, slightly calcareous.
1900	1960	Shale, medium to medium dark gray, calcareous.
	1974	Sandstone, fine to medium grained, frosted, subangular to subrounded, medium to medium dark gray shale.
1970	1990	Shale, medium light to medium gray, slightly calcareous, little fine to medium quartz grains, pyritic.

<u>From</u>	<u>To</u>	<u>Formation</u>
1990	2000	Shale, medium to medium dark gray, little fine grained sandstone.
2000	2020	Shale, medium light to medium gray. Little medium light gray limestone, few free medium grains quartz.
2020	2030	Shale, medium to medium dark gray, free fine to medium grained quartz.
2030	2040	Shale, medium gray, free fine to medium grained quartz.
2040	2050	Shale, medium to medium dark gray, highly calcareous. Free medium grained quartz.
2050	2060	Shale, medium to medium dark gray, calcareous. Very fine grained calcareous sandstone.
2060	2090	Sandstone, very fine grained, calcareous. Medium to medium dark gray shale.
2090	2100	Shale, medium to medium dark gray. Considerable very fine grained calcareous sandstone.
2100	2110	Shale as above, less sandstone.
2110	2130	Sandstone, medium to coarse grained, frosted, subangular to slightly rounded.
2130	2150	Shale, medium light to medium gray. Medium grained sand.
2150	2160	Shale, medium gray. Medium grained, subangular frosted quartz.
2160	2170	Sandstone, fine to medium grained, frosted, subangular to subrounded. Medium to medium dark gray shale.
2170	2180	Sandstone, very fine grained, calcareous and free fine to medium subangular, frosted quartz. Medium light to medium gray shale.
2180	2190	Shale, medium light to medium gray. Very fine to medium grained sandstone.
2200	2210	Sandstone, very fine to medium grained, subangular, frosted. Medium light to medium dark gray shale.
2210	2230	Siltstone, light to yellowish gray, calcareous. Free fine to medium sand grains, medium light gray shale.
2230	2250	Shale, medium light to medium gray, calcareous, fine to medium grain free quartz.
2250	2260	Shale as above, less quartz.
2260	2280	Shale, medium light to medium gray, calcareous, few fine to medium quartz grains.
2280	2300	Shale, medium light to medium gray, calcareous. Little light gray calcareous siltstone.
2300	2310	Shale, medium light to medium dark gray. Medium to coarse, subangular to subrounded, frosted sandstone.
2310	2320	Shale, pale reddish brown to medium gray, calcareous. Medium to coarse grained, iron stained, frosted, subangular quartz.
2320	2340	Shale, pale reddish brown to medium gray. Fine to coarse grained sandstone. Little light gray siltstone.
2340	2350	Shale, medium light to medium gray, calcareous, fossiliferous. Fine to very fine grained sandstone.

<u>From</u>	<u>To</u>	<u>Formation</u>
2350	2370	Shale, medium light to medium gray, slightly calcareous.
2370	2400	Shale, medium to medium dark gray.
2400	2420	Shale, medium light to medium gray, fossiliferous.
2420	2425	Shale, medium light to medium dark gray, calcareous.
2425	2440	Shale, medium to medium light gray, calcareous.
2440	2450	Shale, medium light to pale red, calcareous. Fine free quartz.
2450	2455	Shale, light to medium light gray, calcareous.
2455	2460	Shale, medium light to medium dark gray and little pale red calcareous.
2460	2465	Shale as above, fine to medium grained free quartz.
2465	2470	Shale, medium light gray to pale red, calcareous.
2470	2480	Shale, medium light gray and pale red calcareous. Very fine to fine grained quartz.
2480	2485	Shale, medium light gray and pale red calcareous. Fine grained quartz.
2485	2495	Shale, greenish gray to pale red, calcareous.
2495	2505	Shale, greenish to medium dark gray and pale red, calcareous.
2505	2515	Shale, pale red and light olive to medium gray, calcareous.
2515	2520	Shale, medium light, light olive and pale red, calcareous. Little very fine grained sandstone.
2520	2530	Shale, greenish gray and gray red, calcareous.
2530	2535	Shale, medium gray and little gray red calcareous.
2535	2540	Shale, medium gray, highly calcareous.
2540	2545	Shale, medium to medium dark gray, calcareous.
2545	2555	Limestone, very light to yellow gray, fine grained. Medium light to medium dark gray shale.
2555	2560	Limestone, as above, little fine grained quartz.
2560	2570	Limestone, very light gray, fine grained dense. Medium light gray shale.
	2574	One hour. Shale, medium light gray, calcareous. Very light to pinkish gray, fine grained limestone.
2575	2585	Limestone, very light to light gray, fine grained dolomitic.
2585	2590	Limestone, light gray, fine grained dolomite, medium light gray shale.
2590	2600	Limestone, very light to light gray, fine grained, dense.
	2600	3/4 hour. Shale, medium light to medium dark gray and light olive gray. Very light to light gray fine grained dense limestone.
2600	2607	Shale, light brownish gray and greenish gray, interbedded.
2608	2614	Shale, greenish gray.
2614	2616	Shale, light olive gray, calcareous.
2616	2618	Limestone, light gray, fine grained, dense.
2618	2621	Shale, light olive gray to light brownish gray.
2621	2622	Limestone, very light gray, fine grained chalky, interbedded with light olive gray shale.

<u>From</u>	<u>To</u>	<u>Formation</u>
2622	2624	Shale, light olive gray to medium gray, calcareous.
2624	2629	Shale, medium light gray, calcareous.
2629	2633	Shale, pale olive, calcareous.
2633	2637	Limestone, yellowish gray, sublithographic.
2637	2639	Limestone, light olive gray, fine grained dense.
2639	2643	Sandstone, very fine to fine grained, calcareous.
2643	2645	Limestone, yellow gray, fine grained dense.
2645	2650	Limestone, white fine grained, dense, pinpoint porosity, chalky.
2650	2656	Limestone, white, dense, chalky, fossiliferous, brachiopods.
2656	2659	Limestone, yellowish gray, micro sucrosic.
2659	2670	Limestone, white dense, chalky.
2670	2674	Limestone, greenish gray, dense, chalky.
2674	2679	Limestone, yellowish gray, dense, to sublithographic.
2679	2692	Limestone, white, dense chalky.
2692	2694	Limestone, medium light gray, dense.
2694	2696	Shale, medium light gray, calcareous.
2696	2710	Limestone, white, dense, chalky.
2710	2718	Shale, greenish gray, calcareous.
2718	2719	Limestone, greenish gray, dense, argillaceous.
2719	2721	Sandstone, very fine grained, slightly calcareous.
2722	2724	Limestone, medium gray, fine grained, dense.
2724	2727	Anhydrite, white.
2727	2729	Anhydrite, light olive gray.
2729	2730	Limestone, light gray, fine grained.
2730	2737	Anhydrite, brownish gray, interbedded shale.
2737	2742	Shale, light olive gray, calcareous.
2742	2744	Shale, light greenish gray, calcareous.
2744	2748	Limestone, very light gray, interbedded with medium dark gray shale.
2748	2749	Dolomite, medium light gray, argillaceous.
2749	2754	Dolomite, pale yellowish brown, argillaceous, white anhydrite stringers.
2756 1/2	2777	Anhydrite, white to medium gray interbedded medium gray shale.
2777	2792	Anhydrite, white to medium gray interbedded with pale brown shale.
2792	2802	Anhydrite, white interbedded with light to medium gray shale.
2802	2806	Shale, medium gray with white anhydrite inclusions.
2806	2811	Shale, interbedded pale brown shale and pale red anhydrite.
2811	2815	Shale, pale brown with inclusions of anhydrite.
2815	2820	Shale, moderate brown.
2820	2825	Interbedded moderate brown shale and white to pale brown anhydrite.
2825	2830	Siltstone, very light gray and light brown, calcareous, arenaceous.
2830	2835	Siltstone, light brown.
2835	2853	Siltstone, light brown, slightly arenaceous.

<u>From</u>	<u>To</u>	<u>Formation</u>
2853	2863	Limestone, medium light gray, fine to medium grained, some pinpoint porosity.
2863	2868	Limestone, medium light to medium gray, fine grained.
2868	2873	Limestone, medium light gray, fine to medium grained, vugular porosity, fossiliferous, brachiopods.
2875	2890	Siltstone, light brown, slightly arenaceous.
2890	2895	Sandstone, light brown, fine to medium grained, silty.
2895	2900	Siltstone, light brown.
2900	2925	Siltstone, light brown, arenaceous.
2925	2930	Siltstone, light brown, highly arenaceous.
2930	2935	Sandstone, fine grained silty
2936	2948	Anhydrite, white, micro sucrosic.
2948	2956	Anhydrite, pale red, medium light gray and light olive gray.
2956	2963	Anhydrite, white, micro sucrosic.
2963	2966	Dolomite, white to very light gray, micro sucrosic.
2966	2970	Dolomite, white, micro sucrosic to chalky.
2970	2981	Limestone, white, fragmental to oolitic, intergranular porosity.
2981	2986	Limestone, white to yellowish gray, fragmental to oolitic, pinpoint porosity.
2986	2991	Limestone, yellowish gray, micro sucrosic, vugular to pinpoint porosity.
2991	2996	Limestone, yellowish gray, fine to medium grained, pinpoint porosity.
2996	3001	Limestone, white, fine grained to oolitic, some intergranular porosity.
3001	3006	Limestone, yellowish gray, micro sucrosic, vugular porosity.
3006	3011	Limestone, yellowish gray, oolitic, intergranular porosity.
3011	3021	Limestone, yellowish gray, fine grained to oolitic, intergranular porosity.
3021	3026	Limestone, yellowish gray, micro sucrosic, pinpoint porosity.
3026	3036	Limestone, yellowish gray, oolitic, intergranular porosity.
3036	3046	Limestone, yellowish gray, oolitic to fragmental, slight intergranular porosity.
3046	3061	Limestone, yellowish gray, fragmental to oolitic, intergranular porosity.
3061	3066	Limestone, white to yellowish gray, micro sucrosic, pinpoint porosity.
3066	3074	Limestone, yellowish gray, oolitic to fragmental, intergranular porosity.
3074	3079	Limestone, yellow gray, oolitic to fragmental, intergranular porosity and light olive gray fine to medium grain. White chert.
3079	3089	Limestone, yellowish gray, micro sucrosic, fossiliferous, with red streaks to fragmental-oolitic, porous.

<u>From</u>	<u>To</u>	<u>Formation</u>
3089	3094	Limestone, yellowish gray, fine grained, dense, some pinpoint porosity.
3094	3099	Limestone, yellowish gray, oolitic to fragmental, intergranular porosity.
3099	3104	Limestone as above, iron stains.
3104	3109	Limestone, medium gray, fine grained dense, tight. Red streaks.
3109	3114	Limestone, medium gray, fine grained dense to fragmental.
3114	3116	Limestone, medium light gray, fine grained, dense.
3116	3124	Limestone, medium light gray, fine grained, dense to light gray highly fossiliferous.
3124	3134	Limestone, very light to light gray, fragmental, intergranular porosity.
3134	3140	Limestone, white to very light gray, fine grained to fragmental, pinpoint porosity.
3140	3154	Limestone, light to medium light gray, fragmental, intergranular porosity.
3154	3166	Limestone, light brownish gray, oolitic to fragmental, intergranular porosity.
3166	3171	Limestone, greenish gray, dense, tight.
3171	3176	Limestone, light brownish gray, fragmental to oolitic, intergranular porosity
3176	3181	Limestone, light brownish gray, fragmental to oolitic with intergranular porosity and medium gray, dense, tight.
3181	3186	Limestone, pinkish gray, finely oolitic, little intergranular porosity.
3186	3191	Limestone, pinkish gray, oolitic to fragmental and medium gray micro sucrosic dense.
3191	3196	Limestone, pinkish gray, finely oolitic to finely fragmental, some intergranular porosity.
3196	3206	Limestone, pinkish gray, fragmental to oolitic, intergranular porosity and medium gray dense limestone.
3206	3211	Limestone, pinkish gray, fragmental, highly fossiliferous, brachiopods, intergranular porosity.
3211	3216	Limestone, medium gray, fine grained, dense, with streaks of pinkish gray, fragmental - highly fossiliferous.
3216	3225	Limestone, pinkish gray, fragmental to finely oolitic, fine intergranular porosity.
3225	3230	Limestone, medium gray, fine grained, dense, brachiopods.
3230	3235	Limestone, pinkish gray, finely oolitic to fragmental, fine intergranular porosity and medium gray fine grained dense.
3235	3240	Limestone, light to very light gray, fine grained, mottled.
3248	3253	Limestone, light to medium light gray, fragmental, intergranular porosity, fossiliferous.

<u>From</u>	<u>To</u>	<u>Formation</u>
3276	3280	Limestone, light gray, fragmental, fossiliferous - spiriferid brachiopods.
3280	3282	Limestone, medium dark gray, micro sucrosic, fossiliferous.
3282	3301	Limestone, light to medium light gray, fragmental, fossiliferous, intergranular porosity.
3301	3311	Limestone, very light to medium dark gray, oolitic, intergranular porosity.
3311	3322	Limestone, very light to light gray, oolitic, intergranular porosity.
3322	3336	Limestone, white to yellowish gray, oolitic, intergranular porosity.
3336	3344	Limestone, yellowish gray, fine grained, dense to oolitic.
3344	3349	Limestone, medium light to medium gray, fine grained dense, black mottlings.
3349	3359	Limestone, light to medium gray, fine to medium grained, fossiliferous.
3359	3361	Limestone, medium light gray, fragmental, crinoidal, argillaceous.
	3361	Total Depth.