

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 152

Summary of the Stanolind Oil and Gas Company - Alfred Schwartz No. 1
Well No. 849 - Permit No. 862

by Dan E. Hansen

Stanolind Oil and Gas Co. - Alfred Schwartz No. 1, Billings County, North Dakota. Location: 560 feet from the south line and 659 feet from the east line of Section 34 - Twp. 138N. - Rge. 100W. Elevation: 2818 ground, 2828 RDB. Total depth: 9410.

The Stanolind Oil and Gas Co. - Alfred Schwartz No. 1 was spudded March 31, 1955; drilled to a total depth of 9410 feet; found non-commercial and plugged July 4, 1955. Four drill stem tests were taken and one core was cut at the interval from 2171-2192. A Laterolog and a Microlaterolog were run by Schlumberger June 13, 1955.

Drill Tests:

DST #1 - 8985 to 9032. Tool open 4 hours, shut in 30 minutes. Weak blow diminishing to zero in 2 1/2 hours. Recovered 480' mud cut water. IBHPF 275, FBHPF 350, BHPSI 2980 and still building up.

DST #2 - 9150 to 9170. Tool open 4 hours, shut in 30 minutes. Weak blow increasing to strong blow in 45 minutes. Strong blow throughout test. Recovered 140' gas, 220' free oil, 180' very slightly mud cut free oil, 90' very highly gas and oil cut mud, 30' mud, 150' salt water. IBHPF 100, FBHPF 240, BHPSI 3230 and still building up.

DST #3 - 9175 to 9192. Packer failed after 45 minutes. Very weak blow for 45 minutes. No recovery.

DST #4 - 9168 to 9192. Tool open 5 hours, shut in 30 minutes. Weak blow for 3 hours 50 minutes increasing to good blow for remainder of test. Gas in drill pipe 870' above fluid. Recovered 50' highly oil and gas cut mud, 160' slightly oil and gas cut mud, 90' muddy slightly gas cut water with scum of oil, 450' muddy salt water. IBHPF 25, FBHPF 375, BHPSI 3200 and still building up.

Testing Data

5 1/2" casing landed at 9272'. Perforated casing 9164-9168 with 4 holes per foot. Swabbed tubing dry and acidized with 200 gallons regular acid. Formation broke down at 3200 psi. Dropped back to 2100 psi. Injection rate 1/4 barrel per minute. Held acid on formation for 1 hour. Pressure dropped back to 1000 psi and held. Swabbed a total of 58 barrels of oil and 12 barrels of water from perforated zone. Perforated interval 9142 to 9160 with 4 jet shots per foot. Acidized with 1800 gallons regular acid. Acid started into formation at 1000 psi increasing to 2100 psi at end of displacement. Injection rate 1 barrel per minute. Held acid on formation 1 hour and pressure dropped to 1200 psi. Swabbed 25% oil and 75% water. Squeezed perforations with 30 sacks cement. Perforated 9138 to 9154 with 4 shots per foot. Acidized with 500 gallons regular acid. Formation broke down at 5000 psi to 4700 psi to 4000 psi to 2700 psi. Pressure at 2600 when last 6 barrels went into formation. Acid injection rate 2/10 barrel per minute. Held acid on formation 45 minutes.

Pressure dropped back to 1250 psi in 30 minutes and held. Swabbed 14 barrels water and 2 barrels of formation oil in 7 hours. Reacidized with 1500 gallons regular acid. First 840 gallons of acid went into formation on vacuum. Starting pump pressure 500 lbs. and increased to 1500 when 1500 gallons acid displaced. Average injection rate .27 barrels per minute. Held acid on formation 50 minutes and pressure dropped to 700 pounds. Swabbed a total of 147 barrels of fluid in 10 1/2 hours consisting of 53 barrels of load oil, 10 barrels of formation oil, 36 barrels acid water and 48 barrels formation water. Fluid level at 7500'. Last four hours a recovery of 25% oil 75% water.

Casing Record

Ran 2 joints 89.38' of 10-3/4" 32.75# 8RT H-40 casing and 924.54' of 10-3/4" 40.5# 8RT J-55 casing. Casing landed at 1025' and cemented with 900 sacks regular cement. None recovered.

Ran 1236 feet of 5 1/2" 23# N-80 casing, 1778 feet of 5 1/2" 20# N-80 casing, 6309 feet of 5 1/2" 17# N-80 casing. Casing landed at 9272 feet and cemented with 450 sacks regular cement premixed with 450 sacks Posmix A, 13 sacks Gel., .04 per cent HR₄ and 42.6# salt per sack of cement. Recovered 5445' of 5 1/2" casing.

Plugging Record

Set 10 sack cement plug in 5 1/2" casing in perforated zone at 9138-9154. 15 sack cement plug set in top of 5 1/2" casing at 5445. 10 sack cement plug set in bottom of 10-3/4" casing at 1025. 5 sack cement plug set in top of surface casing.

Formation tops were determined from samples and laterolog. Doubtful or obscure tops were not picked. Color names are from 1948 Rock-Color chart (2nd printing 1951) distributed by the Geological Society of America, New York, N.Y.

FORMATION TOPS

Cretaceous system	
Pierre formation	1976
Niobrara formation	4069
Greenhorn formation	4689
Dakota group sandstones	
"Muddy"	5330
Basal sandstones	5612
Jurassic system	
Piper limestone	6657
Triassic system	
Spearfish formation	6820
"Dunham salt"?	6910
"Pine salt"	7000
Permian system	
Ninnekata formation	7312
Opeche formation	7377?
Pennsylvanian system	
Minnelusa formation	7471
Mississippian system	
Big Snowy group	8026

Kibby lime	8415
Madison group	
Charles formation	8560
Mission Canyon formation	8948?

0-60	Lignite.
60-90	Clay, silty, micaceous, light gray.
90-150	Lignite.
150-210	Clay, light gray, micaceous, silty, some very-fine grained quartz.
210-240	Clay, light gray, slightly calcareous with light gray limestone.
240-270	Lignite.
270-300	Clay, light gray, silty, bentonitic, with fine-grained sandstone, micaceous.
300-340	Clay, light gray, bentonitic.
340-430	Sand, medium loose grains of predominately angular quartz. Some light gray fine grained, calcareous cemented, light gray clay. With some lignite.
430-490	Sandstone, light gray, medium grained calcareous angular quartzose. Mica, coal fragments.
490-520	Clay, light gray, silty, spongy.
520-770	Lignite.
770-840	Sand, medium grained, generally angular and consisting predominately of quartz.
840-870	Sand, as above, with light gray clay and light gray, fine grained, dense, limestone.
870-930	Sand and clay, as above.
930-960	Lignite and clay, light gray.
960-1080	Casing cement and lignite.
1080-1170	Lignite.
1170-1416	Lignite, light gray clay, and casing cement.
1416-1476	Clay, light olive gray, silty with traces light brownish gray silt.
1476-1506	Casing cement.
1506-1566	Clay, light olive gray, silty. Loose fine grained quartz grains. Few fragments light brownish gray silt.
1566-1626	Lignite and light gray silt.
1626-1776	Clay, light olive gray, silty. Loose, fine medium grained, angular, quartz, lignite fragments.
1776-1806	Clay, sand, as above. With casing cement.
1806-1866	Sandstone, light gray, calcareous cemented to loose, quartzose, angular, fine medium grained.
1866-1986	Lignite and light gray clay, silty.
1986-3958	Shale, medium gray, massive, compact. Traces of silt and light gray bentonite. Traces very fine grained sandstone from 2526 to 2586.
3958-4116	Shale, as above, becoming spongy and silty. Increase in light gray bentonite content.
4116-4196	Shale, medium gray to medium dark gray, massive, calcareous, "white specks". Traces of pyrite.
4196-4710	Shale, medium gray, massive, compact to spongy, silty, slightly calcareous. Traces light greenish gray bentonite. Trace calcite prisms from 4590.
4710-4840	Shale, medium dark gray, calcareous, massive, trace "white specks". Shale as above. Traces calcite prisms, fragments of fine grained, calcareous sandstone, and light bluish gray bentonite.

4840-4950 Shale, medium gray, calcareous, massive, compact to non-calcareous, spongy. Poor samples.

4950-5300 Shale, medium gray to medium dark gray, massive, slightly calcareous to non-calcareous, compact to spongy. Trace light blue gray and light gray bentonite.

5300-5370 Shale, medium gray, massive, compact to spongy or fissile.

5370-5410 Shale, as above, with a few fragments of fine grained, quartzose sandstone cemented by calcareous material.

5410-5640 Shale, as above.

5640-5680 Shale, as above, with fine medium grained, quartzose sandstone cemented by some pyrite and non-calcareous material.

5680-5730 Shale, as above.

5730-5830 Shale, as above, with traces of coarse grained, iron carbonate "pellets", and fine-grained, quartzose sandstone.

5830-5870 Shale as above, with traces of coarse-grained, angular quartz grains.

5870-5895 Shale, medium gray, massive, spongy to compact.

5895-6010 Shale, as above, to light gray. With traces of greenish gray bentonite.

6010-6040 Shale, as above, with very light gray, quartzose, fine-grained sandstone, containing a green mineral. Traces maroon shale.

6040-6070 Shale, as above with very light gray, fragmental limestone and light olive gray shale.

6070-6150 Shale as above, with gypsum and traces of very fine grained, light brownish gray sandstone. At 6110-6120 is a fragmental, very light gray lime with carbonaceous streaks.

6150-6190 Shale, as above, with traces light gray, very fine grained sandstone, carbonaceous streaked light gray limestone, and light olive gray shale.

6190-6320 Shale as above, with traces light gray, fine grained sandstone.

6320-6510 Sandstone, light gray, fine grained, quartzose. Shale, as above.

6510-6530 Limestone, medium gray, extremely shaly, fine grained.

6530-6550 Shale, as above.

6550-6590 Shale, pale reddish brown, massive, compact, slightly silty, slightly calcareous.

6590-6620 Limestone, light gray, fragmental and fine grained crystalline and gypsum.

6620-6630 Salt. Extraneous samples.

6630-6640 Anhydrite and limey-dolomite, crystalline, light gray, grainy.

6640-6670 Shale, medium gray, massive.

6670-6820 Limestone, pinkish gray, crystalline, fine grained to sublithographic. Much red-brown calcareous shale, traces of anhydrite.

6820-6920 Shale and silt, moderate reddish brown, massive with traces of anhydrite inclusions.

6920-7000 Sandstone, pale reddish brown, fine grained, quartzose. Traces anhydrite and anhydrite inclusions.

7000-7100 Sandstone, as above, with red brown shale, gypsum crystals and anhydrite. With a few traces of salt crystals and salt crusting the samples.

7100-7110 Salt.

7170-7150 Salt? The samples are medium gray shale, but the caliper log indicates interbedded salts with red brown shales.

7150-7270 Shale, medium gray, with red brown shale and silt. Traces light gray, fine grained, crystalline limestone and anhydrite.

7270-7290 Salt.

7290-7370 Shale and silt, red brown, massive. Traces anhydrite and gypsum.

7370-7400 Limestone, moderate orange pink to pale red, anhydritic, fine grained, crystalline, chalky.

7400-7440 Shale and silt, pale-reddish brown, massive, anhydrite inclusions, calcareous with fine grained pale red, quartzose sandstone.

7440-7470 Shale and silt, as above.

7470-7650 Sandstone, pale red to white, fine grained, quartz, calcareous cement to rounded, medium grained, frosted loose quartz grains. Traces anhydrite at 7470-7490.

7650-7700 Silt and shale, pale reddish brown, slightly calcareous, massive.

7700-7760 Sandstone, pale red to white, fine medium grained, angular to rounded, frosted quartz, loose or calcareous cemented.

7770-7790 Sandstone as above, with pale reddish brown shale, and white anhydrite.

7790-7900 Dolomite, limey sandy pale red, fine grained dense with inclusions of fine quartz grains.

7900-8010 Dolomite, sandstone, silt and shale as above. Poor samples, much gray shale.

8010-8040 Cottonseed hulls.

8040-8100 Dolomite, sandstone, silt and shale, as above.

8100-8120 Shale, dark gray, splintery, compact. With dolomite as above.

8120-8160 Cottonseed hulls.

8160-8205 Shale, dark gray, splintery, compact.

8205-8275 Shale, gray as above, with light gray medium grained, fragmental limestone, very light gray, fine grained, dense, crystalline limestone, and traces of light green gray shale. Trashy samples. Ostracods.

8275-8290 Shales and limestones as above, with much loose quartz grains, coarse grained.

8290-8325 Samples as above with traces of fine grained sandstone and gypsum.

8325-8375 Sandstone, white to grayish red, very fine grained to fine grained, quartzose. With traces gypsum, pale red shale, and very light gray limestone. Shales as above.

8375-8400 Samples as above, with much cellophane and cottonseed hulls.

8400-8425 Sandstone, samples as above.

8425-8450 Limestone, dolomitic, light gray to light brownish gray, very fine grained, dense. Traces anhydrite, red shale.

8450-8570 Shale, pale red, massive and light gray limestone, as above. Traces anhydrite. Much cellulose material in the samples. Fair amount anhydrite from 8550 to 8570.

8570-8600 Limestone and anhydrite, light gray fragmental limestone, white anhydrite. Samples are poor consisting mainly of dark gray shale and light gray silt.

8600-8640 Samples as above, caliper log indicates salt.

8640-8670 Samples as above.

8670-8860 Limestone, light gray, fine grained, crystalline with some fragmental limestone. White anhydrite. Much gray shale and cave from above. Salt indicated by caliper log at 8834 - 8846.

8860-9000 Limestone, light brownish gray, fragmental with light gray, fine grained limestone. Much anhydrite. The limestone contains some vuggy to pinpoint porosity. Traces of oolites at 8977-8980. Circulation at 8977.

9000-9171 Limestone, light brownish gray, fragmental, some pinpoint porosity. Much gray shale, traces anhydrite. Circulation at 9070 for 3/4 hour. Circulation at 9170 for 1 hour.

Core #1

9171-9174 Limestone, light brownish gray, fine-grained, crystalline, with oil stains and fair CCl_4 cut.

9174-9177 Limestone, as above, with streaks of dead oil.

9177-9192 Limestone, as above, to coarse-grained recrystallization. Anhydrite streaks. Tight. Minor oil staining throughout. End of core.

9192-9410 Limestone, light brownish gray, fragmental and crystalline, fine medium grained. Circulation at 9204 for 3/4 hour. Trace of pinpoint porosity in the limestone. Much gray shale. Circulation at 9229 for 3/4 hour. Circulation at 9261 for 3/4 hour. Circulation at 9410 for 1/2 hour. Total sample depth, 9410.

9410 Total depth.