NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 148

Summary of the Shell Oil Company Betsy Jorgenson No. 1
Well No. 616 - Permit No. 630

by Dan E. Hansen

Shell Oil Company - Betsy Jorgenson No. 1, Benson County, North Dakota. Location: 660 feet from north line and 1870 feet from west line of Section 5, Twp. 156N. - Rge. 68W. Elevation: 1573.58 Grd., 1584 K.B. Total depth - 2650 ft.

The Shell Oil Company - Betsy Jorgenson No. 1 was spudded June 8, 1954, drilled to a total depth of 2650 feet, found dry and plugged June 20, 1954. One drill stem test was taken. No cores were taken. Electrical, Micro, and Gamma Ray-Neutron logs were run by Schlumberger June 19, 1954.

Drill Stem Tests

DST. #1 - Ran Johnson formation tester. Packer at 2364', tail piece to 2453; three outside pressure bombs; 1/2" bottom hole choke; perforations at 2364-74 and 2438-2448. Shut-in 15 minutes. Dropped bar 11:05 p.m. June 17, 1954. Fair blow during 60 minute open test. Shut-in 30 minutes. Recovered 1375' (9.7 bbls) watery mud grading to muddy water. No shows of hydrocarbons.

Initial flowing pressure	112 psi
Final flowing pressure	650 psi
Shut-in pressure	859 psi
Hydrostatic pressure	1170 psi
Maximum salinity	58000 ppm
NaCl (field titration)	

Casing Record

Set - 8 5/8" surface casing at 202' with 135 sacks cement.

Plugging Record

Cement plugs of 10 sacks each were set at the following depths: 2640'; 2400'; 2150'; 1820'; 1700'; and 200'. A plug of 5 sacks was set at the surface.

Formation tops were determined from samples and electric logs. Doubtful or obscure formation tops were not picked. Color names and identifying numbers are from the 1948 Rock-Color Chart. (second printing, 1951) distributed by the Geological Society of America, New York, N.Y.

FORMATION TOPS

Cretaceous system	
Niobrara formation	776
Greenhorn formation	1274
Dakota group sand	1784
Jurassic system	
Piper limestone	2135
Mississippian system	
Lodgepole formation	2380
Englewood formation	2591
Devonian system	
“Nisku” formation	2627

0-20	Clay, medium gray, lumpy, with much fine-medium grained, angular, clear, pink quartz grains.
20-30	Sand, light yellowish brown, grains of fine very coarse white, pink, clear quartz, angular. Coarse, angular grains of very pale orange dolomite and coarse, angular grains of feldspar and greenstone.
30-100	Shale, medium gray, lumpy, compact to disaggregated. Sand as above.
100-220	Gravel, pebbles, subrounded, greenstone, pale brown dolomite. Sand as above. Shale as above. Casing shoe at 202 feet.
220-760	Shale, medium gray, with greenish, tinge, massive, compact, silky with, microscopic mica.
760-930	Shale, medium-gray, massive, compact, silky, flaky, spongy. With traces of light gray bentonite.
930-1000	Shale, as above, with traces of calcareous medium gray shale with “white specks” and traces of dark gray shale.
1000-1050	Shale, medium-gray to dark gray, soft, spongy, flaky, micro-micaceous, “white specks”, traces of light blue gray bentonite. Trace pyrite.
1050-1310	Shale, as above, no “white specks” poor samples as above.
1310-1420	Shale, medium dark gray to dark gray, soft flaky, silky, calcareous, “white specks”. With calcite prisms, shell fragments and traces of Globigerina. Traces of pyrite.
1420-1670	Shale, medium gray, massive, silky, compact, pierre. With above shale. Traces of dark gray, soft, flaky, shale, non-calcareous.
1670-1780	Shale, medium dark gray to dark gray, soft, flaky, disaggregated to massive, spongy. Trace pyrite. Much Greenhorn cave.
1780-1810	Shale, as above, traces of greenish gray, waxy, platy, flaky, compact shale, traces of fine-grained, white to light-gray, quartzose sandstone, traces of pyrite, and traces of light red brown, fine grained, quartzose, sandstone. Trace loose, fine to medium, quartz grains.
1810-1870	Shale, green gray, soft, waxy, flaky, disaggregated. Light red brown shale, soft, massive, compact. Sandstone light gray, calcareous, friable fine grained, quartzose. Traces pyrite. Much dark gray shale as above. Traces red brown fine grained, quartzose sandstone. Moderate amount of pink-white anhydrite. Traces of medium grained, loose, subrounded, clear quartz grains and angular, gray chert.
1870-1910	Sandstone, light gray, fine grained, calcareous, angular, quartzose sandstone, porous. Shale, green-gray, light red brown, dark gray, as above. Pyrite, anhydrite, as above.
1910-1950	Shale, samples as above.
1950-1970	Limestone, fine to coarse grained, light gray white, carbonaceous streaks. Shales, sandstones, and traces of anhydrite as above.
1970-2070	Shales, sandstones, limestone, anhydrite as above. Traces of medium to coarse grained, clear, subrounded to rounded, loose quartz grains.
2070-2090	Limestone, yellowish gray, fine grained to sublithographic, vuggy.
2090-2150	Shale, green gray, splintery, waxy, compact and light brown gray, compact fissle shale. White-pink anhydrite. Traces of medium coarse grained, clear, angular to rounded quartz grains, pale yellowish brown, rounded dolomite, coarse grained, and angular, pink, white, clear, feldspar fragments. Trace of gray, subrounded

chert fragments.

2150-2180	Limestone, yellowish gray, fine grained, microsucrosic, sandy, grading into a calcareous, fine medium grained, frosted, well rounded, quartzose sandstone. Shales as above. Interval from 2155-2160 is white anhydrite.
2180-2195	Shale, green gray and light red brown, fissile, waxy, compact. With much dark gray shale. Traces anhydrite and above limestone.
2195-2225	Limestone, yellowish gray, fine grained to sublithographic, microsucrosic. Shale as above.
2225-2255	Limestone, light gray, very fine grained to sublithographic, microsucrosic, slightly argillaceous. Shales as above.
2255-2280	Anhydrite, white, fibrous to crystalline. Limestone and shales as above. Much dark gray, massive shale.
2280-2295	Limestone, light gray, very fine gained to sublithographic, argillaceous, dense. Anhydrite as above. Shale, as above.
2295-2365	Anhydrite, white, crystalline. Limestone and shales as above.
2365-2375	Limestone, dolomitic, light brownish gray to pinkish gray, fine medium grained crystalline. With above anhydrite.
2375-2400	Shale, dark gray, traces of anhydrite.
2400-2475	Limestone, fine to medium grained, crystalline, fragmental, medium coarse grained, pinkish gray with reddish mottling. Traces of brachiopod shell fragments and crinoid stems. Shales as above.
2475-2540	Limestone, pinkish gray, fine grained to sublithographic, micro-sucrosic. Much white to pinkish gray chert.
2540-2560	Limestone, yellowish gray, fine medium grained to sublithographic, microsucrosic. Much white to pinkish gray chert.
2560-2590	Limestone, pinkish gray, fine medium grained, microsucrosic, fragmental, medium grained. With much white to pink gray chert.
2590-2635	Limestone, as above. No chert.
2635-2650	Dolomite, pale red to pale brown, medium grained, sucrosic, intergranular porosity.
2650	Total Depth.