

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 146

Summary of the Shell Oil Company Joseph O. Blegen No. 1
Well No. 695 - Permit No. 709

by Dan E. Hansen

Shell Oil Company - Joseph O. Blegen No. 1, Benson County, North Dakota.
Location: Center of the SW SE of Sec. 14 - Twp. 155N. - Rge. 67W. Elevation:
1458 ground, 1469 K.B.

The Shell Oil Company - Joseph O. Blegen No. 1 was spudded August 26, 1954, drilled to a total depth of 2396 feet, found dry and plugged September 3, 1954. No cores were taken. One drill stem test was run. Electrical, Micro, and Gamma Ray-Neutron logs were run by Schlumberger September 3, 1954.

Drill Stem Tests

DST #1. 2180-2256 - Johnson formation tester. 1/2" bottom hole choke. Three outside pressure bombs. No water cushion. Dropped bar 11:00 p.m., 9-1-54, after taking 15 minute initial shut-in pressure. Fair blow continuing throughout test. Tool open 1 1/2 hours. Shut-in 1 hour. Recovered 435' muddy salt water. Maximum salinity 26,000 ppm NaCl (titrated). Salinity of mud: less than 300 ppm NaCl.
IFP - 0, FFP - 230 psi, SIP - none, FHP - 1200 psi (find hydrostatic pressure).
15 minute initial shut-in pressure - 830 psi.

Casing Record

Set 8 5/8" surface casing at 236' with 191 sacks of construction cement.

Plugging Record

Cement plugs of 10 sacks each were set at the following depths: 2340', 2200', 1980', 1580', 1555', and 237'. 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 Americas New York, N. Y.

FORMATION TOPS

Cretaceous system	
Niobrara formation	608
Greenhorn formation	1119
Dakota group sands	1540
Jurassic system	
Piper limestone	1963
Mississippian system	
Lodgepole formation	2185
Devonian system	
"Nisku" formation	2323
Duperow formation	2375

190-200 Coarse sand, consisting of clear, angular vitreous, medium to very coarse grained loose quartz, coarse-grained to small pebbles of loose, angular, quartz-biotite-feldspar metamorphic rock (greenstone?) fragments, small pebbles of subrounded to rounded, oily, very pale orange, loose limestone and dolomite fragments, and fragments of medium gray-greenish gray, platy, compact, soapy shale fragments.

200-230 As above.

230-240 As above, also contains a few fragments of calcite prisms.

240-260 Shale, medium gray-greenish gray. Samples consist mainly of cement. Casing shoe at 238 feet (EL).

260-370 Shale, medium light gray, greenish gray, platy, compact, microscopic mica, soapy.

370-400 Shale, as above, plus slightly silty bentonitic medium light gray, spongy, lumpy, earthy shale fragments.

400-420 Shale, as above, plus small amounts of very light greenish gray bentonite.

420-520 Shale, medium light gray, greenish gray, platy, compact, microscopic mica with slightly silty, bentonitic, spongy, lumpy, earthy shale fragments. Samples from 420-450 contain traces of hard, massive, silky, light brownish-gray shale fragments.

520-590 Shale, medium light gray, platy, compact, lumpy to flaky and lumpy, earthy to soapy, silty, micaceous, slightly bentonitic, with fragments of medium gray shale and light-gray, light greenish gray bentonite.

590-660 Shale, medium light gray to medium gray, silty, lumpy, spongy, flaky to disaggregated, earthy with traces of very light gray white bentonite.

660-690 Shale, medium dark gray, lumpy, spongy, flaky to disaggregated, earthy, to velvety, soft, slightly calcareous and bentonitic. Contain traces of, pyrite and irredescent fossil fragment.

690-810 Shale, medium gray, medium dark gray, lumpy, spongy to flaky, calcareous, contains "white specks", slightly micaceous.

810-830 Samples missing.

830-850 Shale, as above.

850-880 Samples missing.

880-910 Shale, medium light gray, greenish gray, compact, platy, soapy to earthy. Samples contain much cement and sandstone, fragments. The samples look the same as those in the interval from 240 to 300 feet.

910-1060 Shale, medium gray to medium dark gray, lumpy, spongy to disaggregated, moderately calcareous, slightly micaceous. The samples contain traces of pyrite and very light greenish gray bentonite.

1060-1140 Shale, medium gray to dark gray, lumpy, spongy, flaky, disaggregated, slightly micaceous, slightly calcareous, traces of pyrite, shell fragments, pinkish-gray limestone fragments, and light gray to light greenish gray bentonite.

1140-1170 Shale, dark gray, "white specks", calcareous, flaky, lumpy, to disaggregated, soft, micaceous, with traces of pyrite and light blue gray bentonite.

1170-1250 Shale, medium gray to medium dark gray, calcareous, flaky, lumpy, to disaggregated, micaceous, "white specks" and fragments of calcite prisms.

1250-1280 Shale, medium dark gray to dark gray, moderately calcareous, soft, lumpy, spongy, mainly dis aggregated. Globigerina. Trace calcite prisms, pyrite, light blue gray bentonite.

1280-1460 Shale, medium dark gray to dark gray, soft, lumpy, spongy to flaky. Traces of light gray bentonite, silty, and shale as above.

1460-1540 Shale, dark gray, flaky to spongy, massive, soft, earthy. Traces of light greenish gray bentonite, light brownish gray silt.

1540-1560 Shale, dark gray as above, with traces of pyrite, light greenish gray bentonite, and iron carbonate siltstone concretions.

1560-1600 Shale, medium dark gray, as above, with traces of pyrites, calcareous, well cemented fragments of light gray, micaceous, angular fine to medium grained, quartzose sandstone. With traces of light brown shale throughout.

1600-1730 Shale as above, but calcareous to non calcareous. Many fragments of calcareous cemented light gray, micaceous, angular, fine grained quartzose sandstone with light green mineral. Traces of light grayish brown calcareous shale, massive, oily, soft, light calcareous greenish gray shale, reddish brown shale, and pyrite. Also traces of loose, medium grained, rounded quartz grains. Very small amount of silty, light reddish brown limestone fragments to very fine to medium grained calcareous, angular, quartzose sandstone.

1730-1770 Shale, light gray and greenish gray, soft, flaky, slightly calcareous, flakes easily, sometimes spongy. With light reddish brown calcareous shale and fragments of reddish brown, fine to medium grained quartzose sandstone, calcareous cemented. Traces of pyrite, light blue gray bentonite, and fragments of light gray, calcareous cemented, fine grained quartzose sandstone. Also traces of purple shale. Much medium dark gray soft micaceous shales as described previously.

1770-1840 Shale and sandstone as above with fragments of pinkish gray gypsum, traces of pyrite, angular to well rounded very coarse loose grains of quartz, very pale orange limestone, gray chert, and greenstone. Plus fragments of soft sandy carbonaceous streaked, crystalline limestone to limey sandstone.

1840-1890 Shale and sandstone as above with loose sand grains as above with much sandy, pyritized limestone shell fragments, light reddish brown shale predominates.

1890-1930 Limestone, white sublithographic, chalky with white to pinkish gray gypsum, pyrite, and light greenish gray, very fine grained to reddish brown, slightly calcareous, friable quartzose sandstone fragments. With greenish gray, reddish brown, and light gray calcareous, flaky to splintery waxy, compact shales.

1930-1970 Shale, greenish gray and olive gray, waxy, splintery to massive and reddish brown, oily to waxy, compact, massive slightly silty and micaceous with traces of above limestone.

1970-2005 Limestone, grayish orange pink, chalky and earthy, grainy, very fine grained and contains fine to medium grained, rounded, clear quartz grains which grades into calcareous sandstone. White anhydrite.

2005-2015 Shale, medium dark gray to reddish brown, massive to flaky, dis aggregated to compact, soapy to earthy, slightly calcareous. With traces of gypsum and greenish gray shale.

2015-2075 Limestone, pale yellowish brown to light gray, very fine grained to sublithographic, argillaceous, dense. With traces of reddish brown and greenish gray shales as above.

2075-2120 Anhydrite, white, massive, and gypsum with limestone as above. Shale is medium gray to greenish gray, fissile to massive, soapy, slightly calcareous. Traces of reddish brown shale.

2120-2180 Anhydrite, and shale as above with much dark reddish brown massive, soft, slightly calcareous shale.

2180-2200 Limestone, dolomitic, cherty, very pale orange to moderate orange pink, fine to medium grained and microscurosic to very fine sublithographic with above shale and anhydrite.

2200-2260 Limestone, grayish orange pink, generally grainy, fine grained to sublithographic. White chert. Little or no porosity except with trace from 2240-2260.

2260-2290 Limestone, as above, but pinkish gray.

2290-2320 Limestone, pinkish gray, grainy, fine grained, little or no porosity.

2320-2365 Dolomite, limey, light brownish gray, microsucrosic to grainy, fine to medium grained, with scattered pinpoint porosity and some intergranular to tubular. Few grains coarse crystalline. Traces of greenish gray and reddish brown to maroon massive shale.

2365-2395 Dolomite, as above, color varies from light brownish gray to grayish orange pink. Shale content increases and more iron staining at 2365-75.

2396 Total Depth.