

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 267

Summary of the S. D. Johnson Company - C. W. Burnham #1
Foster County, North Dakota
Well No. 661 - Permit No. 675

by John P. Bluemle
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The S. D. Johnson Company - C. W. Burnham #1, Foster County, North Dakota. Location: SE SE Section 17, T. 145N., R. 66W. Elevation: 1592 Ground, 1599 D.F Total Depth: 2780.

The S. D. Johnson Company - C. W. Burnham #1 was spudded July 23, 1954; drilled to a total depth of 2780 feet, found dry and plugged July 29, 1954. Three cores were cut. Electric, microlaterolog and gamma ray-neutron logs were run by Schlumberger.

Logging Record:

Schlumberger electric log - run one	7/28/54	162-2779
Schlumberger microlaterolog - run one	7/28/54	1950-2772
Schlumberger gamma ray-neutron - run one	7/31/54	162-2779

Casing Record:

Set 8 5/8" surface casing at 152 feet with 150 sacks of cement.

Coring Record:

#1. 2250-2266
#2. 2266-2291
#3. 2281-2297

Plugging Record:

Plugs in 6 3/4" hole with 10 sacks cement at each place: 1545; 1737; 2082; 2574. 15 sacks cement at top and 169 feet in 165 feet of 8 5/8", 24 lb. surface pipe casing.

Formation tops were determined from samples and electric logs. Doubtful or obscure formation tops were not picked. Color names are from the 1951 Rock Color Chart distributed by the Geological Society of America.

FORMATION TOPS

Cretaceous System

Niobrara Formation	753
Greenhorn Formation	1250
Belle Fourche Formation	1307
"Muddy"	1595
Skull Creek Formation	1610
Fall River Formation	1732

Jurassic System

Unnamed Sands and Shales	1973
Piper Formation	2008
Redbeds	2053

Mississippian System		
	Tilston Interval	2081
	Lodgepole Formation	2094
	Basal Shale	2511
Devonian System		
	Duperow Formation	2578
	Souris River Formation	2720
	Total Depth	2780

0-130	Siltstone, light olive gray, brittle; a few grains of quartz sand; some are slightly calcareous; light texture, conchoidal fracturing and micromicaceous.
130-210	Siltstone as above, with grains of sand.
210-220	Shale, medium gray, very slightly calcareous, resinous, massive to fissile, compact; becomes more massive downward.
220-250	Shale, medium light gray, slightly calcareous, silty, massive.
250-260	Shale, medium gray, moderately calcareous, resinous, silty; inclusions of coal.
260-270	Shale, as above, non-calcareous.
270-280	Shale, brownish gray to medium gray, slightly calcareous, fissile; grades into light brownish gray, sucrosic dolomite.
280-290	Shale, dark gray, slightly calcareous, fissile, compact.
290-380	Shale, light gray, very slightly calcareous, fissile, compact; Inoceramus calcite prisms.
380-390	Shale, as above, and dark gray, slightly calcareous, earthy, fissile.
390-420	Shale, medium gray, non-calcareous, massive, compact.
420-440	Shale, as above, and dark gray, non-calcareous, very fissile.
440-470	Shale, medium light gray, slightly calcareous, massive, compact; calcite prisms; shale becomes darker downward.
470-530	Shale, medium gray to medium dark gray, slightly calcareous with some chips of silty limestone; shale is fissile, becomes lighter downward.
530-580	Shale, light olive gray, silty, slightly calcareous, iron staining, compact, fissile.
580-600	Shale, medium light gray, slightly calcareous with inclusions of limestone; shale is fissile, compact; becomes more calcareous downward.
600-640	Shale, light olive gray, highly calcareous, massive, compact; tiny limestone inclusions and "white specks"; becomes disaggregated at 630.
640-690	Shale, medium gray with brownish stains, highly calcareous; fissile, some bentonite.
690-710	Shale, as above; plus dark gray, massive, compact shale.
710-770	Shale, medium gray, highly calcareous, fissile, bentonitic, pyrite at 760.
770-860	Shale, as above but more silty.
860-930	Shale, light olive gray, calcareous, platy to fissile. Small inclusions of limestone; Globigerina.
930-940	Interval missing.
940-970	Shale, medium dark gray to light olive gray, calcareous, platy to fissile, Inoceramus prisms, bentonitic.
970-1020	Shale, medium gray, silty, calcareous, white specks, bentonitic; limestone, yellowish gray, silty, pitted. Mottled gray.

1020-1040 Shale, light brownish gray, highly calcareous, fissile to platy with inclusions of limestone and abundant white specks; bentonitic and pyritic.

1040-1059 Shale, dark gray, very slightly calcareous, fissile, loose; also light brownish gray siltstone, slightly calcareous.

1059-1079 Shale, light olive gray, highly calcareous, massive; limestone, yellowish gray, silty, pitted.

1079-1089 Shale, brownish gray to dark gray, massive to flaky, calcareous.

1089-1109 Siltstone, medium gray, non-calcareous, porous, massive; light bluish gray bentonite.

1109-1119 Shale, light brownish gray, calcareous, disaggregated.

1110-1130 Shale, medium gray, massive, highly calcareous; calcite prisms; mixed with yellowish gray, pitted, limestone at 1120.

1130-1180 Shale, as above, also shale, medium dark gray, fissile.

1180-1200 Shale, medium gray, calcareous, pyritic; bentonitic; flaky to fissile.

1200-1230 Shale, medium to light olive gray, highly calcareous, fissile with a tendency to be splintery.

1230-1250 Shale, light olive gray, highly calcareous with "pressed" white specks and limestone inclusions; fissile to splintery.

1250-1280 Shale, medium gray, highly calcareous with limestone chips; calcite prisms of *Inoceramus*, pyritic.

1280-1300 Shale, light brownish gray, highly calcareous; calcite prisms, abundant white specks and limestone inclusions; chips of grayish black, fissile, non-calcareous shale at 1290.

1300-1340 Shale, medium dark gray to olive gray, calcareous; abundant calcite prisms, white specks; fissile; increasing percentage of dark gray shale downward.

1340-1370 Shale, medium gray, calcareous, fissile; bluish gray bentonite; becomes olive gray and silty downward; a few chips of yellowish gray limestone mixed in.

1370-1400 Shale, brownish gray, massive to flaky, slightly calcareous, tiny white specks; abundant calcite prisms.

1400-1450 Shale, mixed dark gray to olive gray, highly calcareous, abundant white specks and limestone inclusions and chips, massive to flaky, and silty; abundant calcite prisms; a few chips of bluish gray bentonite: *Globigerina*.

1450-1490 Shale, medium light to medium dark gray, calcareous, resinous, flaky to massive; also chips of yellowish gray limestone, bluish bentonite; pyritic. Some limestone chips are oolitic; cylindrical rods of pyrite between 1480-1490.

1490-1510 Shale, as above; increased calcareousness, limestone chips and calcite prisms.

1510-1550 Shale, grayish black, flaky to disaggregated; earthy; calcite prisms, some fish scales; becomes lighter downward.

1550-1590 Shale, light olive gray to brownish gray, silty; calcareous; limestone chips and calcite prisms; bluish gray bentonite; fossiliferous at 1570 and more silty with limestone inclusions in darker shale; pieces of *Inoceramus* shells at 1580.

1590-1620 Shale, as above, plus siltstone, light brownish gray, massive; aggregates of calcite crystals at 1600.

1620-1640 Shale, as above, plus sandstone, well cemented by iron carbonate medium grained, subangular grain shape. Some pieces are almost entirely calcite grains; shale becomes darker downward.

1640-1670 Shale, dark gray, fissile to flaky, calcitic sandstone, as above.

1670-1690 Shale, light olive gray fissile to massive, silty; bentonite; a few chips of selenite; white specks in shale. Shale is micromicaceous.

1690-1730 Shale, dark gray, flaky, bentonitic, silty, calcite prisms; color lightens downward.

1730-1770 Shale, medium gray, splintery to fissile, calcareous, silty; some bentonite and calcite prisms.

1770-1800 Shale, medium to light olive gray, much as above; finely divided pyrite; chips of yellowish gray sucrosic limestone; black inclusions in shale at 1790.

1800-1870 Shale, as above but more flaky, iron carbonate pellets; quite bentonitic; a few chips of limestone, as above; a few grains of quartz sand at 1830.

1870-1890 Shale, light olive gray, silty, massive; a few sand grains and iron carbonate pellets; finely divided pyrite sands; limestone, as above in increased quantity; a few chips of coal.

1890-1930 Shale; as above with increased amounts of sand and iron carbonate pellets; considerable coal.

1930-1940 Sand, medium grained, subangular to subrounded, frosted to clear, mostly quartz; shale, as above and a few iron carbonate pellets.

1940-1960 Sand, as above; shale, olive gray, flaky to splintery. Bentonite; chips of limestone, sucrosic and grading to calcareous siltstone, also light olive gray.

1960-1980 Siltstone, light gray, non-calcareous, massive; limestone, pinkish gray, oolitic, dense. Sand and iron carbonate pellets.

1980-1990 Sand, fine grained, angular to subrounded, frosted to clear, primarily quartz.

1990-2010 Sand, medium grained, angular to rounded, frosted to clear; shale mixed in; iron carbonate pellets mixed in at 2000 along with limestone, fragmental, white to gray.

2000-2010 Circulation. Sand, medium to coarse, mainly rounded; limestone, fragmental, slabby to oolitic, quite variable, tends to pinkish gray color, pinpoint porosity; shale, silty, olive gray, fissile; iron carbonate pellets.

2010-2020 Sand, shale and limestone, as above except decreased amount of limestone.

2010-2020 Circulation. Limestone, pinkish gray, grainy to slabby, pelecypod fossils; also shale, as above.

2020-2050 Limestone, as above, fossils of Ostrea sp.; inclusions of calcite in limestone; shale, silty, olive gray, splintery; considerable coarse sand.

2050-2070 Shale, olive gray to dark gray, massive to flaky; limestone, as above; some sand; a few pieces of pale reddish brown siltstone at 2060.

2070-2079 1/3 hr. cir. Shale and limestone, as above; siltstone, pale reddish brown to light greenish gray.

2070-2079 1/6 hr. cir. Limestone, yellowish gray, microsucrosic, cavernous porosity; shale and siltstone, as above.

2080-2090 Limestone, as above, pinkish gray, grainy, cavernous porosity; shale and siltstone, as above.

2080-2085 Duperow sample. Limestone and shale, as above; siltstone, pale reddish brown to light greenish gray, pyrite.

5' sample interval from 2090-2250

- 2090-2100 Limestone, very pale orange with reddish inclusions; slabby to sucrosic; dolomitic; dense to tubularly porous; siltstone, pale reddish brown, calcareous.
- 2100-2115 Limestone, slabby to grainy; porosity in the grainy chips; pinkish gray to grayish orange pink; a few oolitic pieces at 2110.
- 2115-2120 Limestone, very pale orange, mottled with reds and purples, slabby to fragmental; shale, silty, all shades of gray.
- 2115-2120 Duperow sample. Limestone, as above but with less shale and a preponderance of pale yellowish brown, dolomitic chips of limestone, grainy, very little porosity.
- 2120-2125 Limestone, essentially as the first of the above two samples; limited pinpoint porosity.
- 2125-2145 Limestone, very pale orange, fragmental to slabby, limited porosity; a few chips of pale yellowish brown limestone are grainy with pinpoint porosity; fossiliferous; increasing percentage of the lighter shaded limestone downward; a few pieces have reddish mottling.
- 2145-2150 Interval missing.
- 2150-2180 Limestone, slabby and fragmental to grainy, grayish orange pink to very pale orange, non-porous; shale intermixed; the lighter limestone contains calcite inclusions; fossiliferous; becomes predominantly medium gray shale at 2170.
- 2180-2190 Limestone, grayish red, (10R4/2), fragmental with very uneven coloring, dense, silty; decreased amount of shale, but increasing again at 2185.
- 2190-2240 Shale, varying shades of gray with green tints; fissile to flaky, some limestone, as above.
- 2240-2250 Shale, as above; limestone, very pale orange, grainy, dense, calcite inclusions; chalky pieces at 2245.
- 2250-2251 Limestone, pinkish gray, reddish and purple streaks and spots; silty, calcite lenses and grading to pure crystalline calcite; mostly slabby, dense.
- 2251-2252 Limestone, much as above but more silty and containing less crystalline calcite; tends to graininess.
- 2252-2253 Limestone, as above, calcite lenses mainly parallel to bedding; some vuggy porosity associated with the calcite lenses; fossiliferous.
- 2253-2254 Limestone, pinkish gray, silty, with fine reddish sand; grainy, dense.
- 2254-2256 Limestone, pinkish gray with pale red purple streaks paralleling bedding; slabby and grading to pure calcite and oolites with associated intergranular porosity; fossiliferous. Whorled from 2255-2256.
- 2256-2257 Limestone, grayish orange pink, grainy, dense.
- 2257-2281 Interval missing.
- 2281-2282 Limestone, grayish orange pink; silty, grainy, negligible porosity.
- 2282-2283 Limestone, laminated pinkish gray and pale red; very silty, pinpoint porosity, grainy.
- 2283-2285 Limestone, grayish orange pink, silty, grainy, some pinpoint porosity; tends to be slabby from 2284-2285.
- 2285-2286 Limestone, as above, plus limestone, grayish red (10R4/2), very silty, pinpoint porosity.

2286-2287 Limestone, grayish orange pink to pale red and laminated; grainy to slabby, the lighter is fossiliferous (brachiopods).

2287-2289 Limestone, as above with calcite lenses parallel to bedding and also as very slabby pure calcite; fossiliferous; chalky inclusions from 2288-2289.

2289-2293 Limestone, pale red (10R6/2), silty, grainy; slightly dolomitic; dense; also slabby from 2290-2291, essentially non-porous; fossiliferous from 2291-2292.

2293-2294 Limestone, pale red to grayish red, silty and grainy to slabby and chalky; dense.

2294-2295 Limestone, yellowish gray to pinkish gray, slabby, dense; also light brownish gray, grainy and dense.

2295-2297 Interval missing.

2297-2330 Shale, varicolored and silty, slightly calcareous; reddish brown porous siltstone; some limestone, grainy, yellowish gray, dense. (Very poor samples).

2330-2340 Shale, as above; increased amount of limestone, grayish orange pink, slabby to fragmental; dense.

2340-2342 Circulation. Shale, varying shades of gray, massive to fissile; limestone, grayish orange pink, slabby, dense.

2340-2385 Shale, as above; limestone, as above; percentage of limestone increases downward; sandy at 2370; much of interval is poor samples.

2385-2450 Shale, as above; limestone, pinkish gray, calcite inclusions, slabby to fragmental, dense; shale percentage increases downward; percentage of limestone picks up at 2410 (poor samples).

2450-2460 Poor samples.

2460-2495 Limestone, pinkish gray, slabby to fragmental with calcite inclusions; little porosity; shale, as above; some of the limestone is chalky.

2495-2510 Limestone, pinkish gray, slabby to fragmental to oolitic; calcite inclusions; intergranular porosity; a few chalky chips at 2500.

2510-2525 Limestone, as above; shale, dark reddish brown and gray; increased reddish shale at 2520.

2525-2545 Shale, varying shades of gray with some dark reddish brown silty chips; a few chips of limestone, as above (poor samples).

2525-2545 Limestone, pinkish gray to grayish red purple; slabby to fragmental; shale, gray and reddish brown; increasing red silty shale downward; iron stains; a few chips of light olive gray dolomite at 2575.

2580-2590 Duperow. Dolomite, calcic, pale yellowish brown, microsucrosic; honeycombed texture and high porosity; some pieces are less porous; also grayish red chips of limestone; also shale and siltstone, as above.

2590-2600 Dolomite, pale yellowish brown and calcic grading to limestone, pale reddish brown; sucrosic to slabby; the dolomite has cavernous porosity, the limestone is dense.

2600-2605 Dolomite, very pale orange, sucrosic, interstitial porosity.

2604 (Cir. 5/6 Hr.) Dolomite, very pale orange grading to pale red, calcic; interstitial porosity to dense and subcrystalline; some gray shale.

2605-2645 Dolomite, pale yellowish brown, and limestone, very pale orange; sucrosic and slabby respectively; dolomite has high interstitial porosity; a few reddish chips appear downward; one shark's tooth at 2630.

2645-2685 Dolomite, grayish orange pink, rhombic to microsucrosic with high porosity on the former; becomes gradually more dense starting at about 2670; fossiliferous at 2680.

2685-2700 Dolomite, calcic, grayish orange pink, sucrosic to rhombic, dense; limestone, same color, slabby, dense; percentage of limestone increases downward.

2700-2710 Limestone, very pale orange, slabby, dense; a few chips of dolomite, as above; red mottling on limestone.

2710-2715 Limestone, very pale orange, highly fossiliferous, slabby to composed entirely of shells.

2715-2730 Limestone, very pale orange, slabby, dense; fossiliferous between 2725 and 2730.

2730-2735 Limestone, as above and dolomite, grayish orange pink, sucrosic, calcic, dense.

2730 (Cir. 3/4 Hr.) Limestone, very pale orange, slabby, some red mottling, dense.

2735-2750 Limestone, very pale orange, slabby to grainy, red mottling, dense; some reddish silty pieces are dolomitic fossiliferous at 2745; increasing siltiness downward.

2750-2760 Limestone, as above; dolomite, grayish orange pink, very silty to sucrosic; dense; pieces of fractured to slabby limestone at 2755; similar to above.

2760-2775 Dolomite, grayish orange pink, sucrosic, pinpoint porosity, reddish mottling, silty.

2775-2780 Limestone, very pale orange, slabby, dense; dolomite, as above.

2780 Total depth.