

GEOLOGIC REPORT

Cities Service Oil & Gas Corp.
 Augusta Unit No. 1-56
 330' FSL & 1650' FWL
 Section 2-28S-4E
 Butler County, Kansas
 15-015-22541

Contractor: Brandt Drilling
 Commenced : 4-27-84 (Set Surface)
 Completed : 5-5-84
 Elevations: 1298 G.L.
 1303 K.B.
 Casing : 8 5/8" at 261'; 5 1/2" at 2568'
 Geologist : Jim Bruggeman

<u>Formation</u>	<u>Sample Top</u>	<u>Log Top</u>
Iatan	1686 (-383)	-
Lansing	1726 (-423)	-
Kansas City	2064 (-761)	2054 (-751)
Base Kansas City	2267 (-964)	2264 (-961)
Altamont	2306 (-1005)	2292 (-989)
Pawnee	2352 (-1049)	2351 (-1048)
Cherokee	2432 (-1129)	2433 (-1130)

Sample Descriptions:

1600-85 Interbedded cream-tan limestone and gray shale, with scattered brown siltstone and green shale.

1684-1726 Limestone: cream-tan, fine crystalline, with interbedded gray, black and green shale.

LANSING 1726 (-423)

1726-1810 Interbedded cream-brown limestone; very fine-medium crystalline, streaks of poor-fair intercrystalline porosity and vuggy porosity, zones of chalky limestone, and mostly gray with some black and green shale and rust siltstone.

1810-28 Limestone: tan, fine crystalline, sugary texture, good intercrystalline porosity, some oomoldic porosity, trace stain, trace fluorescence, very slight halo and ribbon cut, with some gray and black shale.

1828-74 Limestone: cream, fine crystalline, dense, no porosity, no show; interbedded with gray and green shale.

1874-1930 Limestone: tan, very fine crystalline, dense, no show; with interbedded gray, black and green shale and scattered rust siltstone.

1930-44 Limestone: cream and chalky, fine crystalline, poor intercrystalline porosity; small percent of sample is oolitic, medium crystalline, slight stand, no fluorescence, no cut; gray and greenish at base.

- 1944-49 Limestone: cream and chalky, fine crystalline, friable, no show.
- 1949-2054 Shale: mostly gray with black, green and maroon and scattered rust and gray-rust siltstones.

KANSAS CITY 2054 (-751)

- 2054-78 Limestone: white-cream, fine crystalline, poor intercrystalline porosity, fair fluorescence, poor stream and halo cut, trace stain; gray shale at base.
- 2078-86 Limestone: cream-tan, fine crystalline, very oolitic, many rounded, free oolites, 3% fair fluorescence, no cut; scattered crinoid fossils; gray shale.
- 2086-94 Limestone: cream-tan, very fossiliferous and oolitic, poor-fair intercrystalline porosity, good fluorescence, poor cut; some gray, dense limestone and gray shale.
- 2094-2100 Limestone: cream-tan, fine-occasional medium crystalline, fair-good intercrystalline porosity, 25% good fluorescence, poor cut.
CFS
- 2100-2110 Limestone: cream-tan, fine crystalline, poor intercrystalline porosity, 10% fair pale fluorescence, poor cut; trace fossils; gray, black and green shale; trace white chert.
CFS
- 2110-72 Limestone: cream and light gray, very fine-fine crystalline, dense-scattered fair intercrystalline and vuggy porosity, no show; trace crinoids.
- 2172-80 Shale: black, carbonaceous, coaly.
- 2180-2200 Limestone: light gray, very fine crystalline, dense.
- 2200-05 Shale: black, carbonaceous, coaly.
- 2205-44 Limestone: cream and gray, fine crystalline, slightly friable, no show; scattered fossils with interbedded gray, silty shale.
- 2244-67 Limestone: gray-brown, very fine crystalline, trace coarse, visible crystal faces, some staining, trace pale fluorescence, no show; trace chert; abundant gray and green shale.
- 2570 30" Shale: bright green; clear, rounded sand grains and tan sand clusters, trace free oil; chert, clear and white; pale fluorescence in clusters and chert.
CFS
- 45" Sand: rounded grains, medium-coarse grained, pale fluorescence; white chert, pale fluorescence; bright green shale and gray shale.
- 60" Same as above.
Final pipe strap measured 2569.1.

Cable Tool Drill-In

- May 9 Rigged up and drilled cement.
- May 10 As follows:
- 2566-67 Cement and rubber guide shoe.
- 2567-69 Mostly cement; scattered pieces white and yellow chert; scattered round, sand; 1 hour fillup, scum oil.
- 2569-70 Mostly cement; some white and yellow chert; free, round, sand grains and sand clusters, dead oil stain, fair odor, no free oil, some bright green shale; 45 minute fillup, 1 foot oil.
- 2570-71 Free sand grains, sub-angular to well rounded, fine-coarse grained, scattered sand clusters with fair oil stain, trace free oil 15% bright green shale; cement, scattered white and yellow chert; 1 hour fillup, 1 foot oil.
- 2571-72 Mostly cement in sample. Lithology is same as above; 1 hour fillup 26½ feet of oil, no water.
3 hour fillup, 45 feet oil, no water.
1 hour fillup, 21 feet oil, no water.
1 hour fillup, 16 feet oil, no water.
- 2572-73 Dolomite: gray and tan, fine-scattered medium crystalline. Free rounded sand grains as above, white and tan fine-grained sand clusters, good staining; 15% bright green shale. Rapid fluid fillup of 650' fluid; 1 bailer oil off top, 1 bailer water 100' from bottom, 1 bailer water from bottom.
- 2267-92 Shale: gray with some black and green and rust siltstone.

ALTAMONT 2292 (-989)

- 2292-2308 Limestone: cream, medium-coarse crystalline, fair intercrystalline porosity, no show; with gray shale at base.
- 2308-51 Shale: gray and black with some green; some rust siltstone and scattered pyrite.

PAWNEE 2351 (-1048)

- 2351-2418 Limestone: cream-tan, very fine-fine crystalline, dense, no show; with interbedded gray shale and black shale at base.
- 2418-33 Limestone: tan-brown, very fine-scattered medium crystalline, slightly friable, fair intercrystalline porosity, trace stain, very pale fluorescence, no show.

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CHEROKEE 2433 (-1130)

- 2433-44 Shale: black, carbonaceous; with tan-brown, fine crystalline limestone.
- 2344-82 Shale: gray, black and green; with scattered pyrite and some limestone, as above.
- 2482-2500 Limestone: cream-tan, very fine-fine crystalline, scattered pinpoint porosity, slightly friable, no show.
- 2500-16 Limestone: cream-tan, fine crystalline, fair intercrystalline porosity, friable, no show; with abundant gray shale and black shale at base.
- 2516-40 Interbedded shale and limestone, as above.
- 2540-50 Same as above with scattered rounded sand grains.
- 2560 Shale: gray and some cream, fine crystalline limestone; sand, free
CFS round grains, fine-medium grained; fine sand clusters, pale
fluorescence, poor stream and halo cut; bright green shale.
30" same as above with more bright green shale.
- 2565 Sand: rounded, fine-coarse grains, pale fluorescence; some white sand
CFS clusters with dark green inclusions (glauconitic?), calcite cement;
with bright green shale.
30" 70% sand grains as above, dead oil stain, trace free oil.
45" sand; rounded, fine-coarse grained, free and trace clusters, pale
fluorescence, poor cut from clusters; scattered white, calcite cemented
clusters as above; and bright green shale.
- 2568 Same as above with abundant gray and black shale and some cream
CFS limestone (cavings?).
30" 70% medium-coarse, sub rounded-rounded, free sand grains, pale
fluorescence, dark brown and black dead oil stain; bright green shale
and gray shale.
45" sand as above, very pale fluorescence; with abundant gray shale;
some bright green shale.
60" same as above, trace fluorescence.

JB/dj

5-18-84

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State Geological Survey
WICHITA BRANCH