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# GEOLOGISTS REPORT

for

J. Jones #1-86

C, E2, NE, NE, Sec. 4, T9S, R20E

Jefferson County, Kansas

March 1986

by

George E. Petersen C.P.G.S.

DEACON GEOLOGY INC.

professional geologists

GEOLOGISTS REPORT

J. Jones #1-86

March 21, 1986: Called to location @ 7:30 AM.
March 22, 1986: Released from location @ 1 AM.

| FORMATION TOPS | LOG DEPTH | DATUM | THICKNESS |
|---|---|---|---|
| Base KC | 773 | +299 | --- 144' |
| Marmaton | 917 | +155 | 93' |
| Cherokee | 1,010 | +62 | 187' |
| "McLouth Sands" | 1,463 | -391 | 31' |
| Mississippian Lm. | 1,497 | -425 | --- |
| RTD & LTD | 1,520 | | |

Drilling time was plotted from a drilled depth of 800 feet and sample returns were examined microscopically from a drilled depth of 900 feet to TD for the presence of visible hydrocarbons. Formation tops and intervals for this report were picked from the drilling time log, sample returns and the Neutron-Density Porosity Log. There were no visible shows of oil or oil staining in any of the geologic units above the "McLouth Sands"; however, there were several clean sand intervals which had good porosity, and above average resistance values which should be thoroughly evaluated and tested for the possible presence of gas.

CHEROKEE GROUP:

A quick look log analysis has been prepared for several sand intervals above the "McLouth Sands" using an M=1.8 and Rw=.2. No water samples are available in this area for these sands; therefore, it was assumed that the Rw values are somewhat similar to those of the "McLouth" and Burgess sands.

| Interval | Ø | Rt | Sw |
|---|---|---|---|
| 1022-24 | 13 | 8 | 99 |
| 24-26 | 13 | 18 | 67 |
| 26-28 | 13 | 15 | 73 |
| 28-30 | 11 | 10 | 100 |

This interval was found near the top of the Cherokee Group and is commonly called the Squirrel Sand in other areas of eastern Kansas. The sample returns consisted of a coarse grained, well rounded quartz sand with glauconite present. No gas has been produced from this sand in this area to date.

A second sand interval which had good porosity and higher Rt values than were present in adjoining intervals was found between 1216 and 1228. Sample returns consisted of coarse grained, subrounded, calcite cemented, quartz grains. There was no visible evidence of oil or oil staining in these samples.

| Interval | Ø | Rt | Sw |
|---|---|---|---|
| 1216-18 | 11 | 11 | 98 |
| 18-20 | 15 | 12 | 71 |
| 20-22 | 17 | 10 | 69 |
| 22-24 | 17 | 14 | 58 |
| 24-26 | 17 | 14 | 58 |
| 26-28 | 8 | 14 | 100 |

Another sand, located between 1284 and 1300, was calculated due to the good porosity and Rt values indicated on the logs. Sample returns contained a medium to coarse grained, subangular to subrounded quartz sand.

| Interval | Ø | Rt | Sw |
|---|---|---|---|
| 1286-88 | 12 | 10 | 96 |
| 88-90 | 10 | 10 | 100 |
| 90-92 | 15 | 8 | 86 |
| 92-94 | 19 | 10 | 63 |
| 94-96 | 17 | 9 | 73 |
| 96-98 | 13 | 15 | 73 |
| 98-1300 | 11 | 15 | 85 |

The last sand interval above the "McLouth Sands" for which calculations were prepared, was located between 1338 and 1344. Sample returns indicated a coarse grained, loosly cemented quartz sand with no visible shows of oil or gas.

| Interval | Ø | Rt | Sw |
|---|---|---|---|
| 1338-40 | 17 | 15 | 57 |
| 40-42 | 15 | 14 | 66 |
| 42-44 | 11 | 18 | 78 |

While none of the previously discussed sand intervals has proven productive in this immediate area, it should be noted that the nearest well in which a completion attempt was made was over 8 miles away. There are unconfirmed reports of gas production from middle Cherokee Sands to the north and east near Leavenworth in Leavenworth County some 12 to 14 miles away. These sands should be carefully evaluated before eventual abandonment of the well.

The "McLouth Sands" were reached at a log depth of 1463 feet (-391) in this well. Sample returns were of very poor qualilty, probably due to mechanical problems being experienced on the rig during the drilling of this interval. Samples consisted of medium to coarse grained, subrounded, moderately cemented quartz sand. There appeared to be no odor and no show of oil in the samples.

Log calculations for this interval were prepared on location by Mr. Glenn Schmeidler of Log-Tech Inc. using the following values; M=1.8, Rw= .2.

| Interval | Ø | Rt | Sw |
|---|---|---|---|
| 1464-66 | 9 | 14 | 100 |
| 66-68 | 8 | 14 | 100 |
| 68-70 | 9 | 14 | 100 |
| 70-72 | 9 | 14 | 100 |
| 72-74 | 8 | 14 | 100 |
| 74-76 | 8 | 14 | 100 |
| 76-78 | 8 | 14 | 100 |
| 78-80 | 8 | 14 | 100 |

Under normal circumstances, it would be recommended that

this well be plugged and abandoned due to the high Sw values and lack of show and odor. It was recommended that this zone be tested based on wells that were completed successfully that are very near this lease.

The following table gives the relative structural position for wells that lie to the north and west of this lease. These wells all produce commercial quantities of gas.

| | B/KC | Cherokee | McLouth Sd. | Miss. Lm. |
|---|---|---|---|---|
| Eldon Farris 1-86 | +284 | +53 | -391 | -447 |
| Eldon Farris 2-86 | +293 | +61 | -379 | -428 |
| J. Dunn 1-85 | +291 | +64 | -390 | -428 |

The shale content adversly affects the porosity values and the Rt values which in turn cause very high Sw values to be calculated. Sw values of 100% were calculated in the Eldon Farris 1-86 while the Eldon Farris 2-86 calculated Sw values in excess of 90%. The Dunn well some 1320 feet to the north had a cross-over gas effect on the log and calculated Sw values in excess of 65%.

Based on experience with wells having similar log responses, it is expected that gas can be produced from the McLouth Sand in this well.

MISSISSIPPIAN LIME:

The Mississippian was reached at a log depth of 1497 feet (-425). Sample returns consisted of a sandy, tan limestone which became a white to tan semi-lithographic limestone. There was a show of very heavy dark brown to black oil present on fracture faces and in pinpoint porosity. There was a fair odor present.

Due to the very heavy nature of the oil present in this zone, along with the fact that there is no production from this interval in this immediate area, no production of oil or gas is anticipated from the drilled portion of the Mississippian in this well.

CONCLUSIONS AND RECOMMENDATIONS:

The decision to set pipe on this well was based on the structural position and log similarity to existing producing wells located to the north and west. Sample returns were of very poor quality and undoubtly did not reflect the subsurface conditions present in this well. There were indications that a noticable amount of pyrite was present in the lower part of the Cherokee. The presence of pyrite will cause lower porosity and Rt values to be indicated on the logs. The shaly nature of the "McLouth Sands" will also adversly affect Sw calculations due to the water that is bonded to the clay particles.

It is probable that this well will require a frac treatment to fully evaluate its potential to produce gas.

Should additional information be required, please contact me.

Respectfully submitted,

George E. Petersen C.P.G.S.

DEACON GEOLOGY INC.

mp/GEP