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GEOLOGISTS REPORT

for

COG 88-101

Demaranville lease

API No. 15-103-21098

approx. C NE, SE, NW, Sec. 3, T9S, R20E

Leavenworth County, Kansas

March 1989

by

George E. Petersen C.P.G.

DEACON GEOLOGY INC.



professional geologists

GEOLOGISTS REPORT

COG 88-101

March 2, 1989: Called to well @ 6:15 pm, on location @ 7:20 pm. Drilling @ 1120'.

March 3, 1989: Released from location @ 6:45 pm upon completion of logging.

ELEVATION: ~~989~~^{991.2} G.L. (est'd from Topo due to moving location 173' WSW).

FORMATION TOPS	LOG DEPTH	DATUM	THICKNESS	FUHR 2	DEMORANVILLE 3
Base KC	696	+2935	133'		
Marmaton	829	+1602	91'		
Cherokee	920	+6971	500'		
"Coal Marker"	1,328	-339 338	-	-338	-340
"U. McLouth Sd."	1,364	-375 373	15'	-373	-376
"M. McLouth Sd."	1,379	-390 388	19'	-383	-387
"L. McLouth Sd."	1,398	-409 407	11'	-402	-406
"Burgess"	1,412	-423 421	9'	-	-
Mississippian	1,421	-431 429	-	-429	-424
"40' Zone"	1,476	-487 485			
Burlington Keokuk	1,574	-585 583			
RTD	1,627				
LTD	1,624				

Sample returns were examined microscopically from a drilled depth of 1100' to TD for the presence of visible hydrocarbons. Formation tops and intervals for this report were picked from sample returns, drilling time and the Neutron Density-Porosity Log.

There was no visible evidence of the presence of hydrocarbons in any of the geologic units above the "McLouth Sands"; however, in the middle Cherokee (1128-1218), the "Bartlesville Sand" sequence is fairly well developed and should be carefully evaluated as to whether gas may be present in it.

CHEROKEE GROUP:

The middle Cherokee Group contains a sand sequence in this well that is commonly referred to as the "Bartlesville Sands". These sands are located between 1128 and 1218 and they vary from very fine grained to very coarse grained sub-

rounded to rounded quartz. Porosity values vary from less than 5 to approximately 15%. The sands vary from a very clean sand to very shaly. There were no visible shows of oil or gas thru this interval and log calculations indicate 100% water saturation; however, this interval should be evaluated in each well for the possible presence of gas before the well is eventually abandoned.

The "McLouth" sands have been divided into an upper (1364-79), middle (1379-1398) and lower (1398-1410) unit for mapping and correlation purposes.

The upper sand is very fine grained, shaly, has limited porosity and had no visible hydrocarbons present. Log responses indicate that this interval has 100% water saturation and therefore no completion attempt should be considered in this interval.

The middle "McLouth" (1379-1398) is a medium to coarse grained, subrounded white to clear to tan quartz sand ranging from very shaly to moderately clean and porous. It appears from the Dual Induction Log that the oil show observed on the pits and in the samples probably began about 1387 in the lower portion of the middle section. There is also a slight gas effect on the Density-Porosity Log at 1388 and based on information from Mr. Al Justice of Razorback Exploration, the Fuhr No. 2 located one location to the north has produced some gas along with oil.

It is probable that this zone will produce both oil and gas when completed.

The lower "McLouth" (1398-1409) is a medium to coarse grained, subrounded to rounded clear quartz sand with many thin shale laminations. There was a good show of medium to dark brown free oil in the samples and on the pits during the drilling of this interval. There was a strong petroleum odor from the samples and the application of trichlorethane yielded brite streaming yellow fluorescence.

It appears that this interval is capable of producing commercial quantities of oil.

A lower shaly sand was found between 1412 and 1421. This sand occupies an interval between the "McLouth" sands and the Mississippian where the "Burgess" is normally located. It has been called the "Burgess" in this report. There was a show of heavy dark brown free oil and strong odor. Water saturations appear to be too high to attempt to produce at 1989 oil prices.

Log calculations for the middle and lower "McLouth" and "Burgess" sands were prepared on location by Mr. Drylie of Log Tech Inc. using the following values: $M=1.8$, $R_w=.2$. No corrections have been made for any shale factors.

INTERVAL	ϕ	Rt	Sw
1384-86	12	13	81
86-88	15	16	60
88-90	16	20	50
90-92	15	15	62
92-94	15	10	78
94-96	18	12	59
96-98	18	20	45
98-1400	18	25	41
1400-02	19	25	39
02-04	18	20	45
04-06	15	15	62
1412-14	17	11	65
14-16	17	10	68
16-18	16	11	69

When compared with information from surrounding wells, it appears that this well will produce commercial amounts of oil along with some gas.

MISSISSIPPAIN LIME:

The Mississippian was reached at a log depth of 1421' (-431) which was some 16+ feet lower than anticipated. There was no show of oil or gas in the upper portion of this interval which consisted of a light tan, grainy to argillaceous limestone and white tripolitic chert.

A zone commonly called the "40' Zone" was found at a log depth of 1476 (-487). This interval (1476-1488) consisted of a gray dolomitic tan sucrosic limestone with a good show of free medium to dark brown free oil. There was a good odor and a good show of oil in the pits. Log calculations for this interval indicated 100% water saturation. A second break occurred between 1534 and 1537. There was a good odor and show of oil in the samples and on the pits. Due to the thinness of this break and the 100% Sw values which were calculated it is doubtful if this zone could be commercially productive.

The "Burlington Keokuk" was reached at a log depth of 1574 (-585). This porous zone is composed of light tan to light brown succrosic dolomite and light brown limestone along with large amounts of white to gray trioplitic chert. There was a strong show of gas including H₂S on the pits and a good show of medium brown free oil in the samples and on the pits.

Log calculations prepared by Log Tech personnel on location used an $M=2.0$ and $Rw= .17$.

INTERVAL	\emptyset	Rt	Sw
1572-74	7	70	70
74-76	9	30	82
76-78	12	18	80
78-80	12	15	88
80-82	11	15	95

Because of the high calculated Sw values it was decided on location to not set pipe thru these intervals in the Mississippian.

CONCLUSIONS AND RECOMMENDATIONS:

The "McLouth" sands appear to have the potential to produce commercial quantities of oil along with some gas. The structural position of this well to surrounding wells is given in the following table.

FORMATION	COG 88-101	DEMORANVILLE #3	#2	FUHR #2	Wagoner #1
"Coal Marker"	-338 ⁷	-340	-	-338	-345
"U. McLouth"	-375 ³	-376	-	-373	-381
"M. McLouth"	-390 ²⁸	-387	-	-382	-390
"L. McLouth"	-408 ⁷	-406	-402	-402	-409
"Burgess"	-423 ¹	-	-	-	-
Mississippian	-431 ²⁷	-424	-427	-429	-431

It should be noted that this well site was moved 173' WSW of the staked location and the elevation used has been estimated off of a USGS topographic map. The elevation should be shot and all formation tops refigured using the correct elevation.

It is not known if the tops in the original wells are correct or not so at some point in time a resurvey of the existing well elevations would be advisable.

Should the Mississippian come in much above -420 in any

other wells, consideration should be given to again penetrating the "Burlington Keokuk". The show of oil and log calculations in this well indicate the zone is close to being good enough to set pipe on.

The drilling time log and the electric do not match in most areas of the well. There appears to be a four to six foot difference as is shown on the top of the "40' zone". There does not appear to be an explanation for this difference at this time, all tops and measurements were made from the electric logs.

Should additional information be required, please contact me.

Respectfully submitted,

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DEACON GEOLOGY INC.

mp/GEP