

FRANCO CENTRAL OIL CO.

POTTER "C" #2

ELLIS COUNTY, KANSAS

FRANCO CENTRAL OIL COMPANY

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ELLIS COUNTY, KANSAS

SEC. 29 TWP. 11S RGE. 16W

NE-NE-SE

Intervals are marked on the data sheet as having possible shows in the Arbuckle Formation. The intervals are presented for possible verification by geological data and the possibility of evaluation in the event that the section is better developed elsewhere in the reservoir.

The bore hole, water salinities, invasion depths, cementation factors and R_{mf}/R_w ratios are held constant and establish the conditions for the use of the charts.

The zones in the Arbuckle Formation were calculated using an ROS of 40%, correction factor of $.36 (1-ROS\%)^2$, cementation factor of 2, R_w of .09 and a R_{mf} of .056 @ 104 deg. A sheet is attached giving a complete breakdown of the intervals calculated from the FORXO.

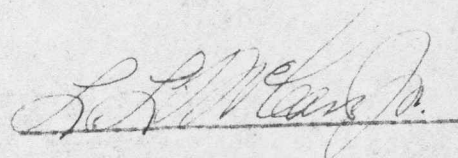
In calculating the Radiation Guard Log in the Arbuckle Formation a cementation factor of 2, R_w of .09 and a logarithmic porosity scale was used. A sheet is attached giving a complete breakdown of the intervals.

A summary sheet is also attached comparing the FORXO and Radiation Guard Log in porosity and saturation.

This analysis was prepared in accordance with the General Terms and Conditions as stated in Section III D in the Welex, Inc., Price Schedule.

Our staff of skilled engineers welcome the opportunity to assist you with your completion problems, and we look forward to the privilege of serving you again soon.

Analyst

A handwritten signature in cursive script, reading "L. L. McLean Jr.", written over a horizontal line.

L. L. Mc Lean Jr.

Sales Engineer

Hays, Kansas

FORMATION Arbuckle
WELL Potter "C" #2
FIELD Potter S/E
COUNTY, STATE Ellis, Kansas

DEPTH INTERVAL 3305-3354
Rmf .056 @ 104 Rmf .622
Rw .09 Rw

DATA SHEET FOR FORXO LOG ANALYSIS

NO.	DEPTH	FORXO	POROSITY %	RT (GUARD)	SATURATION %
1.	3305*	11.5	12	46	38
2.	3306*	5.5	17	37	30
3.	3307	21	8.5	49	51
4.	3308	4	20	18	35
5.	3309	4	20	15	39
6.	3310*	5	18	20	37
7.	3311*	5	18	25	34
8.	3312*	4.5	19	31	27
9.	3316	21	8.5	60	47
10.	3317	35	7	60	57
11.	3318	20	9	33	60
12.	3319	35	7	110	42
13.	3320	10	12.5	110	23
14.	3321	20	9	49	50
15.	3325	8	14	50	31
16.	3326	10	12.5	18	56
17.	3327	3	23	9	42
18.	3328	3	23	9	42
19.	3329	3.5	21.5	13	40
20.	3330*	3	23	8	46
21.	3331*	3	23	8	46
22.	3332*	3	23	8	46
23.	3338	3	23	6.5	51
24.	3340	16.5	10	35	51
25.	3341*	21	8.5	25	71
26.	3346	10	12.5	48	35
27.	3347	4	20	25	34
28.	3348*	3.5	21.5	10	45
29.	3352	12	11.5	32	46
30.	3352	4.5	19	21	35
31.	3354*	3.5	21.5	17	34

* Silty

[illegible]



COMPANY: FRANCO CENTRAL OIL COMPANY
 WELL: POTTER "C" #2
 FIELD: POTTER S/E
 COUNTY, STATE: ELLIS COUNTY, KANSAS
 DATE: APRIL 18, 1959

SUMMARY OF LOG ANALYSIS AND
 CALCULATED HYDROCARBONS IN PLACE
 FOR RADIATION-GUARD LOGS

Formation Name	ARBUCKLE	ARBUCKLE	ARBUCKLE	ARBUCKLE
Depth, Feet	3306-3312	3316-3322	3324-3332	3345-3347
Weighted Average Porosity, Percent.	20.0	13.5	19.7	17.0
Cut-Off Porosity, Percent. ¹ (From Graph)	-----	-----	-----	-----
Weighted Average Water Saturation, % of Pore Space. (Calculated for Section)	31.8	27.3	44.6	26.0
Average Interstitial Water, % of Pore Space. (From Graph)	omit	omit	omit	omit
Net Porous Footage. ²	6	6	8	2
Resistivity of Interstitial Water. (Rw)	.09	.09	.09	.09
Hydrocarbons in Place. ⁴ (Reservoir Bbls. Per Acre-Ft.)	1086	775	775	1008
Hydrocarbons in Place. ³ (Reservoir Bbls. Per Acre)	6516	4650	6200	2016

- ¹ Porosity below which, theoretically, no fluid will be produced.
² Above cut-off value.
³ From equation: $(1 - S) \times \phi \times 7758 \times \text{net porous footage}$.
⁴ From equation: $(1 - S) \times \phi \times 7758$.
⁵ See discussion.

WELEX, Inc.

By

L. L. McLean

This analysis is offered to the client as an aid in economic evaluation and subject to the inherent limitations of log analysis as defined in Welex publication "Interpretation Charts For Electric Logs and Contact Logs."



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SUMMARY OF LOG ANALYSIS AND
CALCULATED HYDROCARBONS IN PLACE
FOR RADIATION-GUARD LOGS

Formation Name	ARBUCKLE			
Depth, Feet	3351-3354			
Weighted Average Porosity, Percent.	18.0			
Cut-Off Porosity, Percent. ¹ (From Graph)	-----			
Weighted Average Water Saturation, % of Pore Space. (Calculated for Section)	36.0			
Average Interstitial Water, % of Pore Space. (From Graph)	omit			
Net Porous Footage. ²	3			
Resistivity of Interstitial Water. (Rw)	.09			
Hydrocarbons in Place. ⁴ (Reservoir Bbls. Per Acre-Ft.)	930			
Hydrocarbons in Place. ⁵ (Reservoir Bbls. Per Acre)	2790			

¹ Porosity below which, theoretically, no fluid will be produced.

² Above cut-off value.

³ From equation: $(1 - S) \times \phi \times 7758 \times \text{net porous footage}$.

⁴ From equation: $(1 - S) \times \phi \times 7758$.

⁵ See discussion.

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SUMMARY

After analyzing both the Radiation Guard and FORXO surveys, the following is a comparison of approximately the same intervals on both logs.

In both cases the percent porosity and the percent water saturation were calculated on a foot by foot basis and the results of each were averaged to obtain a one point comparison.

Depth	Porosity (FORXO)	Porosity (Neutron)	Saturation (FORXO)	Saturation (Neutron)
3306-3312	16.5%	20.0%	36.3%	31.8%
3316-3322	8.8%	13.5%	46.5%	27.3%
3324-3332	20.3%	19.7%	43.6%	44.6%
3338-3342	13.8%	17.0%	57.6%	47.5%
3345-3347	18.0%	17.0%	38.0%	26.0%
3351-3354	17.3%	18.0%	38.3%	36.0%

It is the recommendations of Welox, Inc., that, although the FORXO or its competitive equivalent gives a better "pin point" porosity in precise well conditions, the Radiation Guard Log is by far in supremacy. This is based on the following points:

1. FORXO or its competitive equivalent reads effective porosity. This is very evident in the zones 3316-3322 and 3338-3342.
2. Neutron reads total porosity present. This again is evident in zones 3316-3322 and 3338-3342.
3. Water Saturation is derived from an assumed Residual Oil Saturation. This ROS can vary from 10% to 40%, thus another assumption in the calculation of the FORXO or its competitive equivalent is utilized.
4. Where the mud cake is thick or highly resistive, the FORXO tool or its equivalent is of least value.
5. Porosity is determined by using Resistivity of Mud Filtrate.