

FRANCO CENTRAL OIL CO.

POTTER "C" #2

ELLIS COUNTY, KANSAS

FRANCO CENTRAL OIL COMPANY

POTTER "C" #2

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.

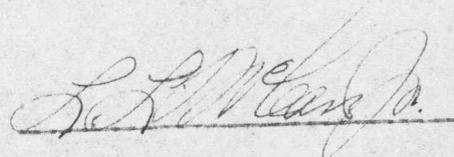
In calculating the Radiation Guard Log in the Arbuckle Formation a cementation factor of 2,  $R_w$  of .09 and a logarithmic porosity scale was used. A sheet is attached giving a complete breakdown of the intervals.

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



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

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## DATA SHEET FOR RADIATION-GUARD ANALYSIS

COMPANY FRANCO CENTRAL OIL COMPANY DEPTH INTERVAL 3305-3355  
 WELL POTTER "C" # 2 FORMATION ARBUCKLE  
 FIELD POTTER S/E Rmf .056 @ 104 Deg.  $\frac{Rmf}{Rw} = .622$   
 COUNTY, STATE ELLIS KANSAS Rw .09

NO.	DEPTH	HOLE SIZE	NEUTRON-GAMMA COUNTS/S	*(1) (2)or(3)		(4)	(5) or (6)		REMARKS
				$\phi$	Ro'	$\frac{Ra}{Ro'}$	S		
							Di=	Di=	
1.	3306-3308		515	17		43	27		
2.	3308-3310		470	21.5		17	35		
3.	3310-3312		470	21.5		24	29.5		
4.	3316-3318		530	14.5		60	27		
5.	3318-3320		580	12		110	24		
6.	3320-3322		550	14		50	31		
7.	3324-3326		565	13		50	33.5		
8.	3326-3328		500	18		14	45		
9.	3328-3330		455	23		12	37		
10.	3330-3332		430	25		8	43		
11.	3338-3340		500	18		10	53		
12.	3340-3342		520	16		20	42		
13.	3345-3347		505	17		45	26		
14.	3351-3354		500	18		22	36		

\* (1) INDICATES CHART NUMBER TO BE USED



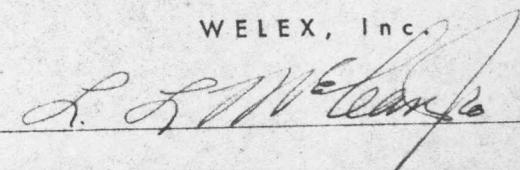
COMPANY: FRANCO CENTRAL OIL COMPANY  
 WELL: POTTER "C" #2  
 FIELD: POTTER S/E  
 COUNTY, STATE: ELLIS COUNTY, KANSAS  
 DATE: APRIL 18, 1959

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. <sup>1</sup> (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. <sup>2</sup>	6	6	8	2
Resistivity of Interstitial Water. (Rw)	.09	.09	.09	.09
Hydrocarbons in Place. <sup>4</sup> (Reservoir Bbls. Per Acre-Ft.)	1086	775	775	1008
Hydrocarbons in Place. <sup>2</sup> (Reservoir Bbls. Per Acre)	6516	4650	6200	2016

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

WELEX, Inc.

By 

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."

## 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.