Schlumberger

COMPENSATED NEUTRON-FORMATION DENSITY

COMPANY: SCHLUMBERGER WELL SERVICES, INCORPORATED

WELL: ALBA 13

FIELD: WILDCAT

COUNTY: HERNANDO DE LARA, MUNICIPIO

STATE: ESTADO FALCON, VENEZUELA

Other Services: DIL, BHC, CNL, CDL, NGT, CBL, VDL

Permanent Datum: GL Elev.: 0 ft

Log Measured From: KB 12 ft Above Perm. Datum

Drilling Measured From: KB

Date	Run No.	Depth Driller	Depth Logger	Bottom Logged Interval	Top Log Interval	Casing Driller	Casing Logger	Bit Size
11-12-74	ONE	2000	2000	1998	SURFACE	13 3/8 @ 1996	1996	12 1/4

Type Fluid in Hole	Density	Viscosity	pH	Fluid Loss	Source of Sample	Rm @ Meas. Temp.	Rmf @ Meas. Temp.	Rmc @ Meas. Temp.	Source Rmf	Source Rmc
LIGNOSULFONATE	9.2	45	10.5	4.8	FLOWLINE	0.90 @ 75°F	0.60 @ 75°F	1.20 @ 75°F	MEASURED	CALCULATED

Rm @ Bht	Time Since Circulation	Time Since Stop	Max. Rec. Temp.	Equip. Location	Recorded By	Witnessed By
0.60 @ 200°F	12 HRS	1 HR	200°F	MARACAIBO	J. ROSSI	J. MARTINEZ

Remarks: The well open, logged and borehole relevant data were furnished by the customer.

RUN NO.	ONE
Bit Number No.	PDC-1
Duration	20 HRS
Tension, KIPS	-
Pump Pressure	-

EQUIPMENT DATA	
Meas. Point	-
Meas. Point	-
Meas. Well	-
Meas. Spacer	-
Meas. Pad	-
Meas. Calibration	-
Meas. Power	1055
Meas. Error	0.0101
Meas. Scale	31001
Meas. Calibrator	1000
CNL Gain	1025
CNL Offset	1025
Meas Recorder (TM)	1762
Depth Recorder (TM)	282
Meas. Recorder Speed	-
Generators Type	-
Generators Power	-
Density Source	Cs137

CALIBRATION DATA		
GR	Before CPS	1.80
	Before API	300
	After CPS	1.80
	After API	300
Short Spacing - Before Log		18996
Short Spacing - After Log		18996
Long Spacing - Before Log		1895
Long Spacing - After Log		1895
Near - Before Log		1264
Near - After Log		1264
Far - Before Log		565
Far - After Log		565

Run	Time	Tool Type	Tool Number	Hole Size	Casing Size	Weight	Depth Driller	Depth Logger	Bottom Logged Interval	Top Log Interval
1	12:00	DIL	1	12 1/4	13 3/8	48	1996	1996	1996	122
2	20:00	CDL	1	12 1/4	13 3/8	48	2000	2000	1996	122

Run	Tool Type	Tool Number	Hole Size	Hole Condition	Mud Density	Mud Viscosity	Mud Resistivity	Mud Temperature	Max. Temperature	Equipment Location	Recorded By	Witnessed By
1	DIL	1	12 1/4	GOOD	9.2	45	0.90 @ 75°F	200°F	200°F	MARACAIBO	J. ROSSI	J. MARTINEZ
2	CDL	1	12 1/4	GOOD	9.2	45	0.90 @ 75°F	200°F	200°F	MARACAIBO	J. ROSSI	J. MARTINEZ

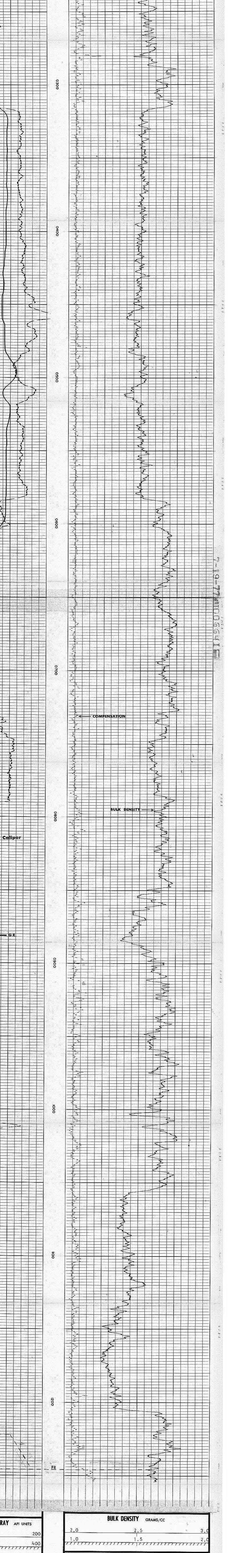
ACCEPTANCE OF THIS PRINT SHALL CONSTITUTE YOUR ACCEPTANCE OF THE FOLLOWING: THE INTERPRETATIONS WE PROVIDE ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT, AND DO NOT, GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE ASSUME NO RESPONSIBILITY FOR ANY LOSS OR DAMAGE SUFFERED AS A RESULT OF ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO OUR PROPOSAL DATED AS OF THE TIME OF THE INTERPRETATION, AND OUR GENERAL TERMS AND CONDITIONS SET FORTH IN OUR CURRENT PRICE SCHEDULE.

CALIPER DIAM. IN INCHES 6 — 15

GAMMA RAY API UNITS 0 — 200; 200 — 500

CORRECTION DRAM/CC -0.5 — 0.25

BULK DENSITY DRAM/CC 1.0 — 1.5 — 2.0



GAMMA RAY API UNITS 0 — 200; 200 — 500

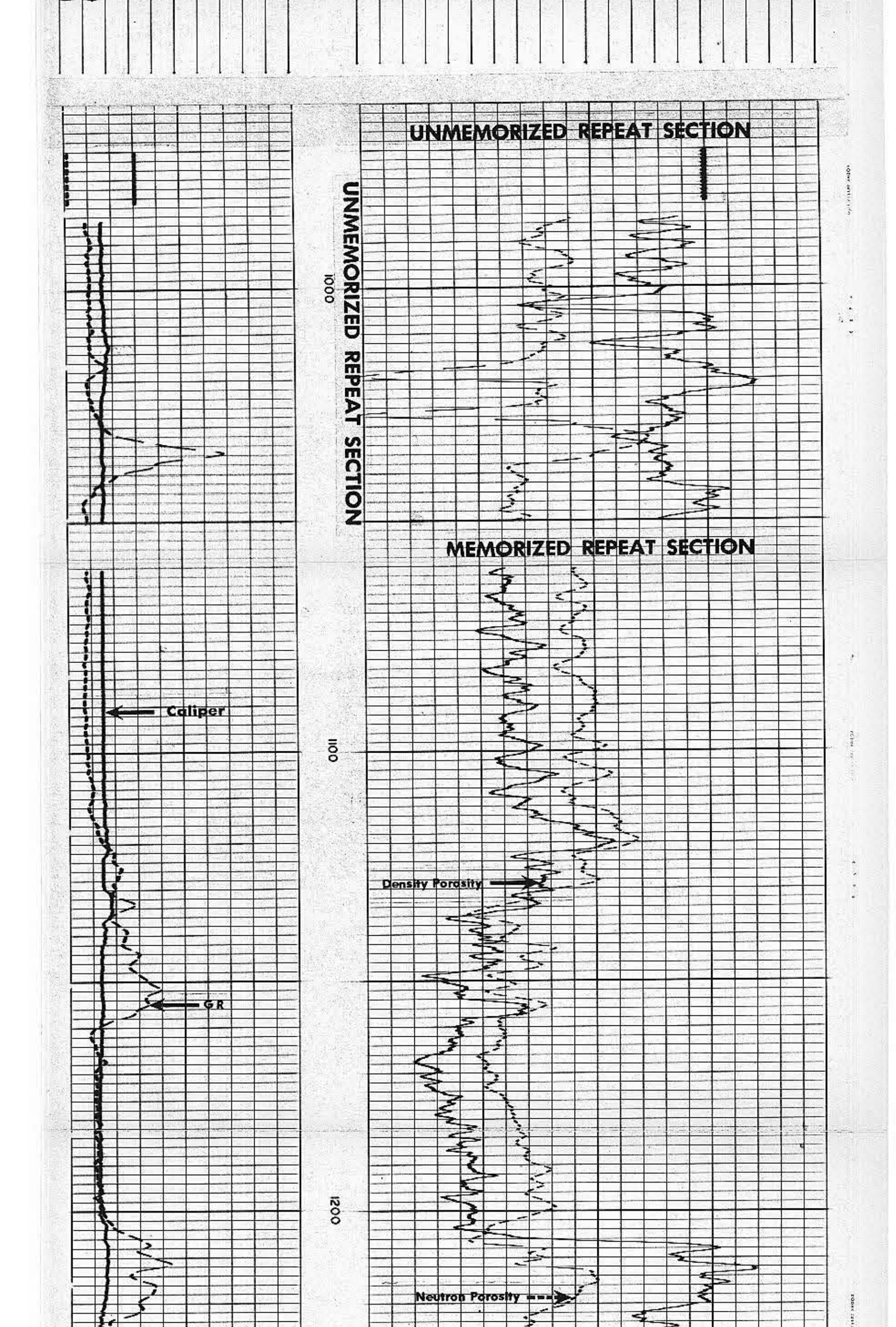
CALIPER DIAM. IN INCHES 6 — 15

BULK DENSITY DRAM/CC 1.0 — 1.5 — 2.0

CORRECTION DRAM/CC -0.5 — 0.25

POROSITY INDEX % LIME MATRIX COMPENSATED FORMATION DENSITY POROSITY 30 — 20 — 10 — 0 — -10

COMPENSATED NEUTRON POROSITY 30 — 20 — 10 — 0 — -10



GAMMA RAY API UNITS

0 — 200

200 — 400

CALIPER DIAM. IN INCHES

5 — 15

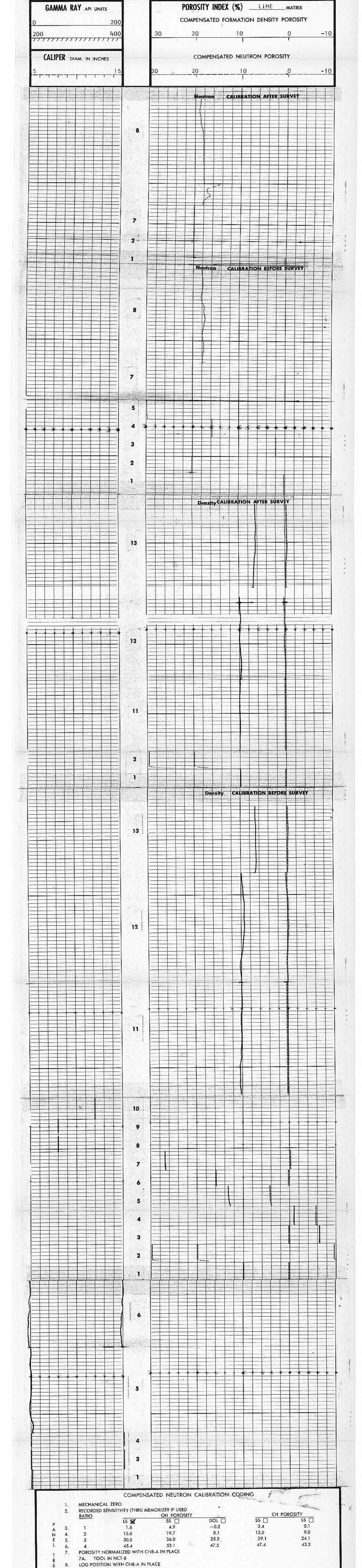
POROSITY INDEX (%) LIME MATRIX

COMPENSATED FORMATION DENSITY POROSITY

30 — 20 — 10 — 0 — -10

COMPENSATED NEUTRON POROSITY

30 — 20 — 10 — 0 — -10



COMPENSATED NEUTRON CALIBRATION CODING

1. MECHANICAL ZERO
2. RECORDED SENSITIVITY (THRU MEMORIZER IF USED

PANEL TEST

	RATIO	OH POROSITY LS ☒	SS ☐	DOL ☐	CH POROSITY SS ☐	LS ☐
3.	1	1.6	4.9	−0.2	2.4	0.1
4.	2	15.6	19.7	8.1	13.0	9.0
5.	3	30.5	36.0	25.2	29.1	24.1
6.	4	45.4	53.1	47.5	47.4	43.2

7. POROSITY NORMALIZED WITH CNB-A IN PLACE
   7A. TOOL IN NCT-B
8. LOG POSITION WITH CNB-A IN PLACE
   8A. LOG POSITION WITH TOOL IN NCT-B

OH LS	SS	DOL	CH SS	LS
18	22.2	10.4	15.3	11.2

RATIO (NORMALIZED) = $\frac{2.17}{\text{RATIO (NCT-B)}}$ RATIO LOG

FORMATION DENSITY COMPENSATED CALIBRATION CODING

1. MECHANICAL ZERO
2. RECORDER SENSITIVITY

PANEL TEST — FDC LIQUID

	POS	ρ	$\Delta\rho$
3.	# 1	2.92	.00
4.	# 2	2.78	+.14
6.	# 3	2.42	−.10
6.	# 4	2.35	.00
7.	# 5	2.08	.01

8. MECHANICAL ZERO CALIPER
9. 8" RING
10. 12" RING
11. TOOL CALIBRATE #1 SET $\rho = 2.50$
12. TOOL CALIBRATE #2 SET $\Delta\rho = .00$
13. LOG POSITION $\rho = 2.59$, $\Delta\rho$ — .015

GAMMA RAY CALIBRATION CODING

1. MECHANICAL ZERO
2. ELECTRICAL ZERO
3. RECORDER SENSITIVITY
4. MEMORIZER ADJUSTMENT
5. BACKGROUND
6. CALIBRATE - SOURCE IN PLACE

CALIBRATION RECORD

COMPANY NORTHERN ILLINOIS GAS COMPANY

WELL RAR #1

FIELD WILDCAT

COUNTY HENDERSON STATE ILLINOIS

SCHL. FR 1241
SCHL. TD 1247
DRLR. TD 1247

Elev: KB -
DF -
GL 772