Schlumberger

SIMULTANEOUS
COMPENSATED NEUTRON-FORMATION DENSITY

COMPANY	SANDS-AMERICAN CORPORATION
WELL	SPENCER NO. 1-8
FIELD	WILDCAT
COUNTY	HOLT
STATE	MISSOURI
LOCATION	NE-NE 660' NL 660' EL
SEC	21
TWP	62N
RANGE	37W
Other Services	DIL

COUNTY HOLT / FIELD WILDCAT / LOCATION SEC. 21-62N-37W / WELL SPENCER NO. 1-8 / COMPANY SANDS-AMERICAN CORP.

Permanent Datum: GROUND LEVEL; Elev.: 880
Log Measured From K.B., 4 Ft. Above Perm. Datum
Drilling Measured From K.B.
Elev.: K.B. 884; D.F. ---; G.L. 880

CONFIDENTIAL

Released 2 Jan 76

Date	10-19-74
Run No.	ONE
Depth—Driller	2794
Depth—Logger	2798
Btm. Log Interval	2797
Top Log Interval	150
Casing—Driller	8 5/8 @ 100
Casing—Logger	106
Bit Size	6 1/2
Type Fluid in Hole	FGM
Dens. / Visc.	--- / ---
pH / Fluid Loss	--- / --- ml
Source of Sample	CIRCULATED
Rm @ Meas. Temp.	6.20 @ 63 °F
Rmf @ Meas. Temp.	4.12 @ 68 °F
Rmc @ Meas. Temp.	--- @ ---
Source: Rmf / Rmc	M / ---
Rm @ BHT	3.75 @ 104F
Time Since Circ.	7 HOURS
Logger on Bottom	---
Max. Rec. Temp.	104 °F
Equip. / Location	7701 / ENID
Recorded By	LASKOWSKI
Witnessed By	AVIS

FOLD HERE — The well name, location and borehole reference data were furnished by the customer.

RUN NO.	ONE
Service Order No.	7752
Fluid Level	FULL
Salinity, PPM CL.	---
Speed - F.P.M.	---
EQUIPMENT DATA	
Dens. Panel	EB-489
Dens. Cart.	EB-590
Dens. Skid.	D-687
Dens. Sonde	EC-13
Dens. Source	B-2546
Dens. Calibrator	632
Neut. Panel	A-64
Neut. Cart.	A-71
Neut. Source	FA-420
Neut. Calibrator	AB-460
GR Cart.	JAA-296
Memorizer Panel	B-117
Tape Recorder (TTR)	---
Depth Encoder (DRE)	---
Pressure Wheel (CPW)	---
Centralizers: Type	---
Enter Spring, Standoffs, No.	---
In-line, or None S.O. — Inches	---
CALIBRATION DATA	
GR BKG. CPS	100
GR Source CPS	500
GR Sens. - Cal	---
GR T. C. - Cal	--- --
CNL Short Spacing - Before Log	2640
CNL Long Spacing - Before Log	1040
CNL Short Spacing - After Log	2640
CNL Long Spacing - After Log	1040
FDC P1 — Before Log	504
FDC P2 — Before Log	980
FDC P1 — After Log	504
FDC P2 — After Log	980

SCALE CHANGES

Type Log	Depth	Scale Up Hole	Scale Down Hole

REMARKS:

NOTE: FORMATION FACTOR = $\frac{1}{\phi_{CP}^2}$

$\phi_{CP} = \phi_{CROSSPLOT} = \frac{1}{2}(\phi_{DENSITY} + \phi_{NEUTRON})$

LOGGING DATA

DEPTH Top	DEPTH Bottom	CNP Porosity Scale	CNP Matrix	CNP Auto Corr. or Hole Size Setting	FDC Porosity Scale	FDC Grain Density	FDC Liquid Density	FDC Hole Fluid	GR Sens. Logged	GR T.C.	GR Zero Div. Left	GR Scale Per 100 Div.
150	T.D.	-10/30	LS	YES	-10/30	2.71	1.0	LIQUID	---	---	---	---

All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to Clause 7 of our General Terms and Conditions as set out in our current Price Schedule.

CALIPER DIAM. IN INCHES 4" – 14"

GAMMA RAY API UNITS 0 – 150; 150 – 300

DEPTH

POROSITY INDEX % LIMESTONE 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)

	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	31.3	26.0	25.2	29.1	24.1
6.	4	52.2	61.4	53.0	52.2	45.2

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

RATIO (NORMALIZED) = RATIO (NCT-B) 3.17 RATIO LOG

FORMATION DENSITY COMPENSATED CALIBRATION CODING

1. MECHANICAL ZERO
2. RECORDER SENSITIVITY

PANEL TEST

	POS	FDC LIQUID ρ	Δρ
3.	# 1	2.92	.00
4.	# 2	2.78	+.14
5.	# 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 ρ = 2.50
12. TOOL CALIBRATE #2 SET Δρ = .00
13. LOG POSITION ρ = 2.59, Δρ = .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 SANDS-AMERICAN CORPORATION
WELL SPENCER NO. 1-8
FIELD WILDCAT
COUNTY HOLT STATE MISSOURI

SCHL. FR 2797
SCHL. TD 2798
DRLR TD 2794
Elev: KB 884 DF --- GL 880