

# Arden Ratzlaff

PETROLEUM GEOLOGIST

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## DRILLING TIME AND SAMPLE LOG

COMPANY CHIEFTAIN OIL CO., INC.

LEASE BIG CHIEF No. 2

FIELD STRANATHAN

LOCATION NE SW SW SW

SECTION 6 TOWNSHIP 35S RANGE 11W

COUNTY BARBER STATE KANSAS

CONTRACTOR HARDT DRILLING RIG NO. 1

COMMENCED DRILLING 3-17-11

COMPLETED DRILLING 3-30-11

RTD 5300 FEET LTD 5300 FEET

MUD UP AT 3364 FEET MUD TYPE CHEMICAL

### ELEVATIONS

KB 1404

DF 1402

GL 1394

Measurements Are All  
From K.B.

### CASING

8 5/8" @ 331' W. 355 SX.

5 1/2" @ 3296' W. 275 SX.

### ELECTRICAL SURVEYS

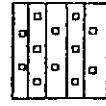


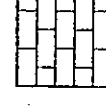
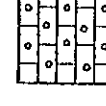

**SUPERIOR-GAMMA RAY DUAL  
INDUCTION, COMPENSATED NEUTRON  
DENSITY, S. P. & CALIPER**

REMARKS AFTER ANALYZING ALL OF THE PERTINENT INFORMATION OF THE ABOVE CAPTIONED WELL, IT WAS THE DECISION THAT CASING BE CEMENTED IN ANTICIPATION OF A VERY GOOD WELL.

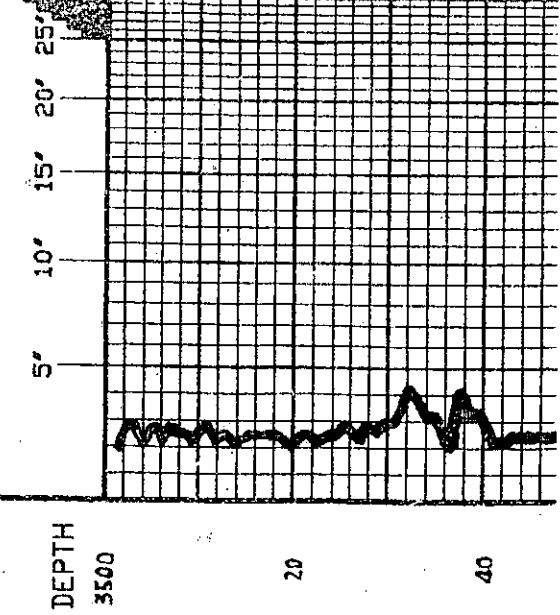
Arden Ratzlaff, Petroleum Geologist

NOTE: NATIVE FURNISHED THE MUD ~ TRILORITE FURNISHED THE DRILL-STEM TESTS ~ SAMPLES DEPOSITED AT THE K.G.S. SURVEY.

### LEGEND

-  Anhydrite
-  Salt
-  Sandstone
-  Shale
-  Carb sh
-  Limestone Dol. Lime
-  Chert
-  Dolomite

DRILLING TIME IN MINUTES  
PER FOOT  
Rate of Penetration Increases



### LITHOLOGY



DEPTH  
3500

20

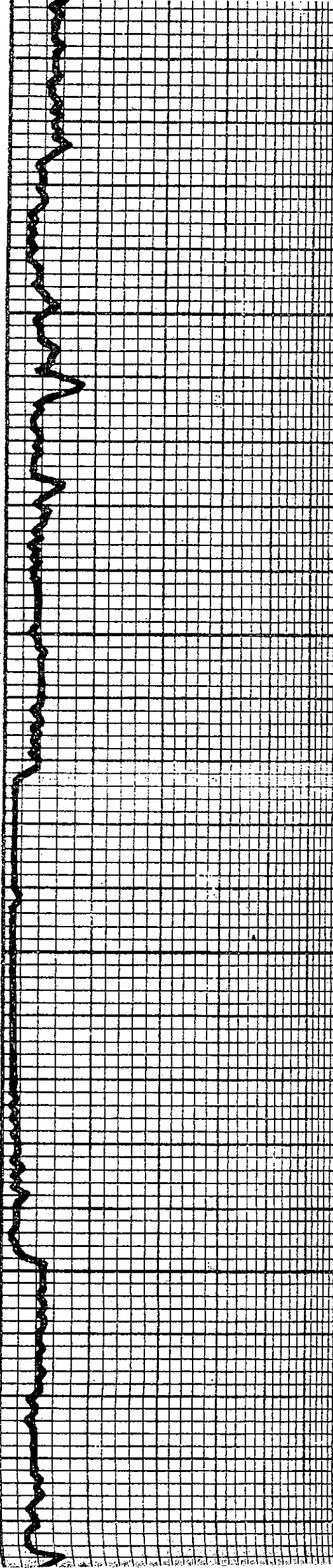
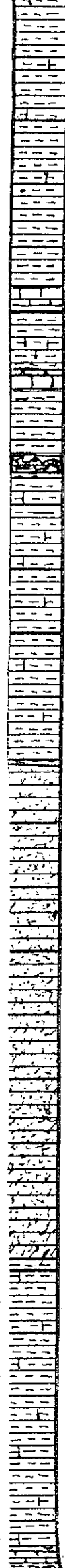
40

### SAMPLE DESCRIPTIONS

SAMPLES TO BE LOGS... CAPTIONED WELLS...  
RIG NO. 1... BARBER COUNTY...  
PRESERVE HARD LN.  
SHEETS AS ABOVE  
SAMPLES TO BE LOGS... CAPTIONED WELLS...  
RIG NO. 1... BARBER COUNTY...  
PRESERVE HARD LN.

### REMARKS

REMARKS



SH. GRY-GRN MED. & SM. DK. GRY (DEN)  
W/ SCAT. IM. AS ABOVE

SAME AS ABOVE

SH. MED TO DK GRY. GRY. GRN. RIV. &  
SCAT. RED. W/ SCAT. DK. GRY. BAN. & TP  
TAN. EN. YLN. DEN. DENSE. HARD. IM.

SH. SILV. COBB. IN PART GRY-GRN. MED.  
TO DK. GRY. SCAT. RED. W/ GRN. & DK. GRY.  
DENSE. HARD. IM.

SAME AS ABOVE

SH. MED TO DK. GRY. GRY. GRN. RIV. (DEN)  
& SCAT. RED. IM. AS ABOVE

SH. SILV. (COBB.) GRY-GRN. MED. TO GRY.  
& RED. W/ SCAT. BAN. & DK. GRY. DENSE. IM.  
- SILT. AS 3700 - LAGGED. W/D.T.

SAME AS ABOVE

SAME IN INCREASE IN RED. SILT.  
GRY. SILT.

SILT. IT. GRY. W. RIV. SPX. EN. YLN. DEN.  
W/ SCAT. PIECES W/ TAN. CLEAR. SILT.  
BAND. OTT. GRAIN. INBAND. DEN. GOOD  
FOR. ALS.

SH. MED TO DK. GRY. RIV. SM. GRY-GRN. &  
SCAT. RED. PLUS SILT. AS ABOVE

SAME IN TAN. & DEN. EN. YLN. DEN.  
DENSE. HARD. IM.



20  
40  
60  
80  
3900  
20  
40  
60  
80  
4000  
20  
40

**HEEBNER**      **3829**  
**-2425**

SAME AS ABOVE W. V. SCAT. BLK. CARB.  
SH

SH. BLK. CARB. W. MED. TO DK. GRN. GRN. CARB.  
S. TO GRN. SIL. D. IS. T. GRN. GRN. CARB. EN. YLN.  
PROP. DENSE. HARD LM.

SH. AS ABOVE PLUS GRN. EN. YLN. PROP. DENSE  
USED LM. PLUS GRN. BLUE. LT. GRN. EN. YLN.  
SUB. CH. V. TO DENSE. MED. HARD LM.

LM. W. GRN. CARB. BLK. LT. GRN. EN. YLN. SUB-  
CH. V. TO CH. V. TO DENSE & HARD.

SH. MED. GRN. GRN. CARB. TO GRN. BLK. (PART  
CARB.) PLUS LM. AS ABOVE. V. SCAT. APPL.  
MED. GRN. EN. YLN. DENSE. HARD LM.

SH. MED. GRN. GRN. CARB. SCAT. BY GRN. LT.  
BLK. PLUS V. SCAT. BY GRN. CARB. EN. YLN.  
PROP. DENSE. HARD LM.

SAME AS ABOVE

SH. AS ABOVE PLUS TR. LM. AS ABOVE

SAME AS ABOVE

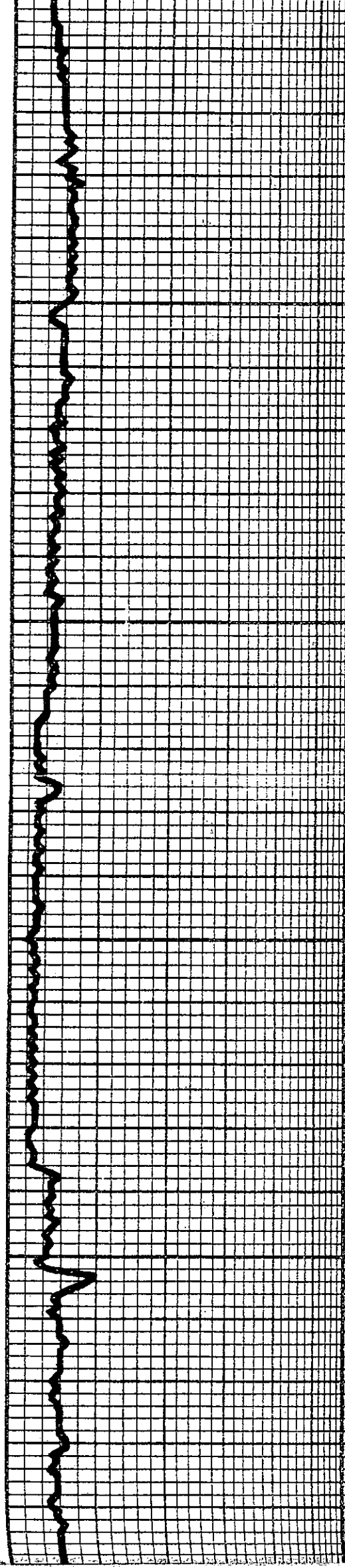
SH. MED. GRN. GRN. CARB. TO BLK. W. V. SCAT.  
BLUE. TR. & BRN. SIL. SILKY TO PROP.  
DENSE. HARD LM.

SAME AS ABOVE

SH. MED. GRN. SCAT. GRN. CARB. V. SCAT.  
BLK. V. SIL. SILTY TEXT. IN PART SOFT  
TO MED. HARD W. SCAT. BLUE. TR. & BRN.  
LM. AS ABOVE.

SAME W. INCR. IN GRN. GRN. SIL. CONTENT.

60  
80  
4100  
20  
40  
60  
80  
4200  
20  
40  
60  
80



SH. MED GRY. GRY-GRN & TR DK GRY TR  
SILTY W BRN. EN YLN. DENSE. HARD LM

SH AS ABOVE W TRULY BRN MIXED IN  
PART EN YLN. SUB-FULLY TO DENSE  
HARD LM

SOME AS ABOVE

SH. MED GRY & GRY-GRN W SILTY W  
SPOT LM AS ABOVE

SH AS ABOVE W SPOT BLUE TRN BRN  
& TR GRY. DENSE DENSE HARD LM

SOME AS ABOVE

SH. MED TO DK GRY & SM GRY. GRN W  
SPOT TRN & BRN. EN YLN. DENSE LM

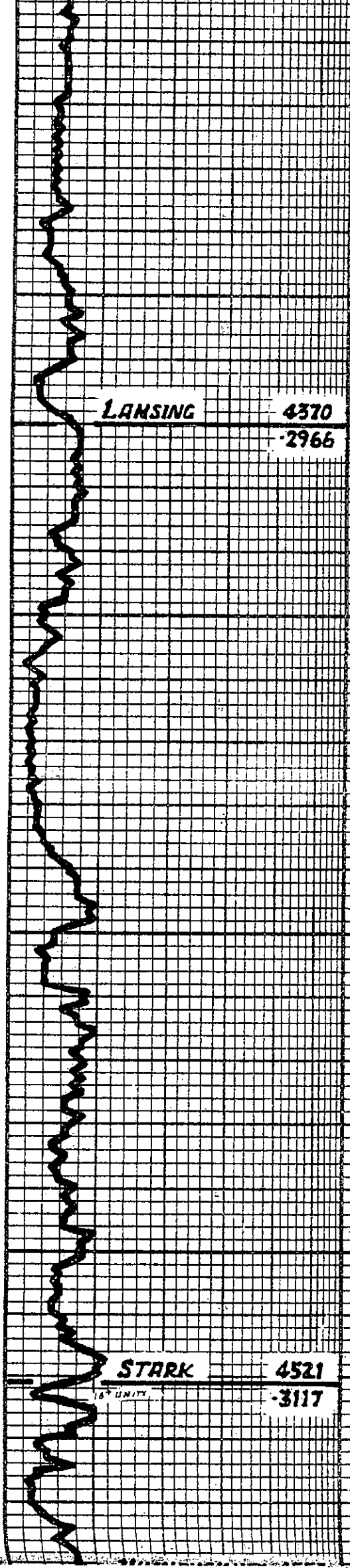
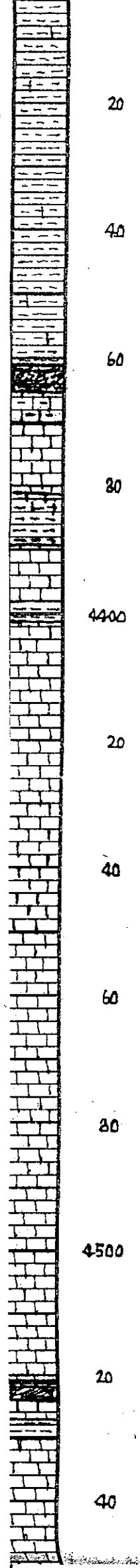
SOME AS ABOVE

SOME AS ABOVE

SH. MED TO DK GRY W SPOT GRY-GRN &  
TR BLK

SH. MED TO DK GRY. GRY-GRN & BLK W  
BLUE TRN & BRN. EN YLN. DENSE,  
HARD & TR SILTY LM

SH. MED TO DK GRY. SPOT BLK TR SILTY  
IN PART. EN YLN. BRN. EN  
YLN. DENSE HARD LM



SAME AS ABOVE

SAME W/ LT GRY. SILTY TO TR SOFT. MUSHY SH.

SH-MED GRY SCOT GRY-GRN & BK GRY & TR BLK SH.

SH-BLK CARB & SM-MED GRY. GRY-GRN W/ BLUE. GRY TAN & BRN EN XIN. SUB-CHLKY TO DENSE. HARD LIM.

LANSING 4370  
-2966

LM-BLUE GRY TAN & BRN EN XIN. SUB-CHLKY TO DENSE. HARD W/ COAT BLK CARB & SH AS ABOVE.

LM-CRM. BLUE GRY TAN & BRN EN XIN. EDS (BRACK) SUB-CHLKY TO DENSE & HARD W/ COAT. SH AS ABOVE.

LM-WH. CRM. BLUE GRY & TAN. SUB-CHLKY TO DENSE. HARD. SUB-CHLKY TO TR.

LM AS ABOVE W/ LT GRY. EDS. SUB-TR. TRANSL. SUB-CHRT.

SAME AS ABOVE

LM-WH. CRM. BLUE GRY & TAN. EN XIN. CHLKY & SUB-CHLKY TO DENSE. HARD. CHLKY & TR W/ THO. LIM.

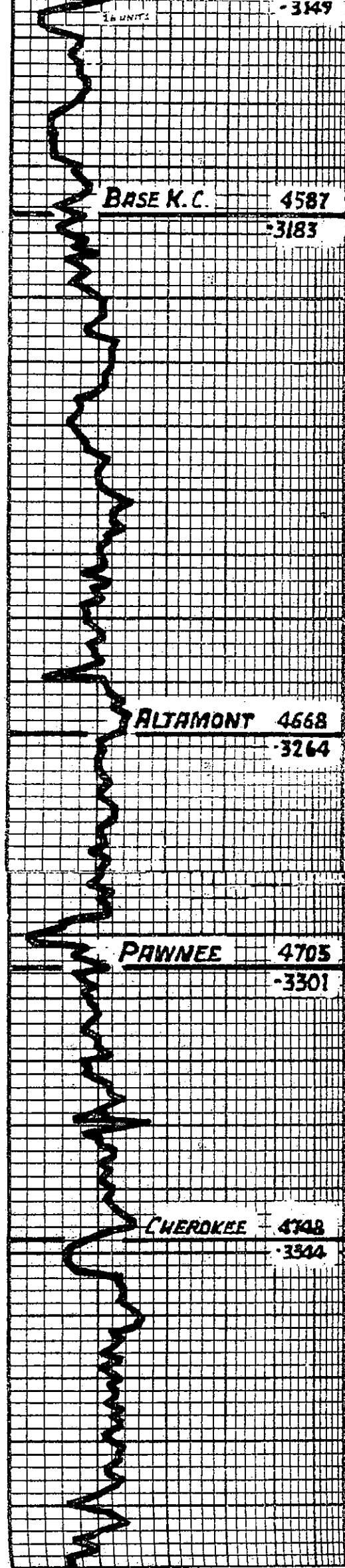
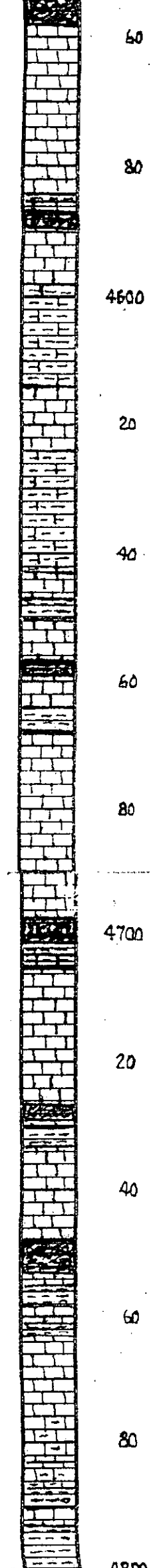
LM AS ABOVE. EN XIN. MED. CHLKY. TR. CHLKY TO DENSE & HARD. W/ COAT & TR TAN. EDS. SUB-CHLKY CHRT.

STARK 4521  
-3117

SAME W/ BLK CARB SH.

LM-CRM. BLUE GRY & TAN. EN XIN. SUB-CHLKY & CHLKY TO DENSE. HARD. W/ MED TO DK GRY. BLK/COAT CARB SH.

**DST No. 1 (4517-4509')**  
 30-60-60-90  
 STRONG BLOW TO B.O.B. IN 40 SEC'S  
 (1<sup>st</sup> OPEN) GAS TO SURFACE 29 MIN'S  
 GAGE 29,000 DEPRTE TO 23,000 CF/D  
 IN 60 MIN'S (2<sup>nd</sup> OPEN)  
 REC: 105 FT OF GAS CLIT MUD &  
 80 FT MDY WTR (3,000 CHLOR)  
 ISIP/1781# FSIP/1734#  
 IFF/27-51# FFP/41-78#  
 TEMP = 116° F.  
 STRAIGHT HOLE SURVEY 4721'  
 DEVIATION = 3 3/4°  
 STRAP PIPE @ 4721'  
 STRAP 4695.60'  
 BOARD 4690.77'



24 UNITS - 3149

SU. BLK. CORR. W. INCL. CORR. BLUE GRAY  
 & TON. EN. YIN. SUB-CHUKY & CHUKY TO  
 U. DENSE & HARD

BASE K.C. 4587  
 3183

LM. BLUE GRAY. TAN. BRN. EN. YIN. SUB-  
 CHUKY TO U. DENSE & HARD W. SCOT. DK  
 GRAY. BLK. CORR. SU.

SH. MED. TO DK. GRAY. GRN. BRN. & GRN.  
 IN BLUE GRAY. TAN. EN. YIN. DENSE & HARD  
 LM. PLUS 1 PIECE GRAY-TAN. EN. TP. RED  
 YIN. VILGY. LM. W. GOOD BRN. (PERM.)  
 W. BRN. STN. BRN. GRN. BLUE. BLUE. GLOSSY  
 OIL. PROBLETS (SLOPE ZONE)

SH. MED. GRAY. GRN. GRAY. GRAY & BLK.  
 (CORR.) W. BLUE GRAY. GRAY. TAN. EN. YIN.  
 DENSE & HARD. LM. PLUS Y. SCOT. LT.  
 GRAY. & TP. TAN. FRESH. SUB. TRANS. CHRT.

SH. AS ABOVE PLUS CONS. GRN. IN. BLUE  
 GRAY. GRN. & STN. TAN. EN. YIN. SUB-CHUKY  
 TO DENSE & HARD. LM.

LM. GRN. BLUE GRAY. GRN. TAN. & BRN.  
 EN. YIN. SUB-CHUKY TO DENSE & HARD  
 W. SH. AS ABOVE PLUS U. SCOT. LT. GRAY  
 FRESH. SWRP. SUB. TRANS. CHRT.

PAWNEE 4705  
 3301

SH. BLK. CORR. MED. TO DK. GRAY. GRN. GRAY-  
 GRN. IN. BLUE GRAY. TAN. & BRN. EN.  
 YIN. DENSE & HARD. LM.

LM. BLUE GRAY. TAN. EN. YIN. SUB-CHUKY  
 TO DENSE & HARD W. SH. AS ABOVE PLUS U.  
 SCOT. LT. GRAY. FRESH. SWRP. SUB. TRANS.  
 CHRT.

CHEROKEE 4708  
 3344

PREP. SH. W. SCOT. BLUE GRAY. TAN. & TP.  
 DENSE & HARD. LM. (DETR. D.S.T.R.)  
 PLUS BLK. CORR. SU.

LM. CORR. BLUE GRAY. TAN. EN. YIN. SUB-  
 CHUKY TO DENSE & HARD W. MED. TO  
 TK. GRAY. GRAY-GRN. BLK. & TR. GRN. SU.

LM. BLUE GRAY. TAN. EN. YIN. SUB-CHUKY  
 TO DENSE & HARD W. SH. AS ABOVE

MISSISSIPPIAN 4809

3405

20  
40  
60  
80  
4900  
20  
40  
60  
80  
5000  
20  
40

37 UNITS - SINTER OFF

84 UNITS

76 UNITS

KINDERHOOK 5089

(8890) CHRT. W/LL IT GRY. SGT TAN & BRN. SET  
DEVIT & WEATHERED W/ BOOR POP. BRN SMT  
SRT OIL & GAS IN POP W/ PRED GOOD POP  
IN WEATH & YNG CHRT - TAN & BRN SMT  
(GRT IN PART) GAS BUBBLES & GRD OIL  
DROPLETS / CAUSING STRONG TO LIVE  
GASSY OIL DROPLETS - V GOOD ODR

(8890) CHRT. W/LL IT GRY. EPOCH SUB-TRANG  
TO SMT ODR W/ BIEFC W/ WEATH & DEVIT  
EDGES W/ BRN SMT. COX GAS BUBBLES &  
OIL DROPLETS & BRN COMP WEATH & YNG  
POP. SGT TAN & BRN GAS BUBBLES & LIVE  
OIL DROPLETS - V GOOD ODR

CHRT. AS ABOVE - STILL GOOD POP. AND  
SGT TAN & BRN GAS BUBBLES. FREE OIL & V  
GOOD ODR

CHRT. GRY & W/LL EPOCH W/ DEVIT POP  
GRADING TO DEVIT WEATH & YNG POP W/  
SGT TAN & V GOOD POP. BRN GAS BUBBLES  
& ADD TAN & BRN OIL DROPLETS - GOOD ODR

CHRT. CHRT. AS ABOVE - STILL GOOD SHOW  
(OIL POP SMT) AND OIL & GAS BUBBLES.  
PLUS V BRN GRY & TAN. EN YNG PRED  
DENSE. HARD & DENSE - M. GOOD ODR

IM-DOLD IN PART. BUFE. GRY & TAN. EN YNG.  
SUB-CHLVY TO PRED DENSE & HARD ---  
STILL CONS. CHRT. AS ABOVE - FAIR ODR

DENSE. BUFE. GRY & TAN. EN YNG.  
PRED DENSE & HARD. BUFE. GRY &  
TO BUFE. GRY. EPOCH. SUB-TRANG.  
CHRT. & SMT. SHOW. CHRT. - WEDY ODR

TAN. IMY. GRY. BUFE & TAN. EN YNG. TP  
APRILL TO DENSE & HARD

TAN. S. W. D. L. Y. & SMT. MED. GRY. EN YNG.  
SUB-CHLVY TO PRED DENSE & HARD W/ L. &  
MED. GRY & TP. GRN. SW.

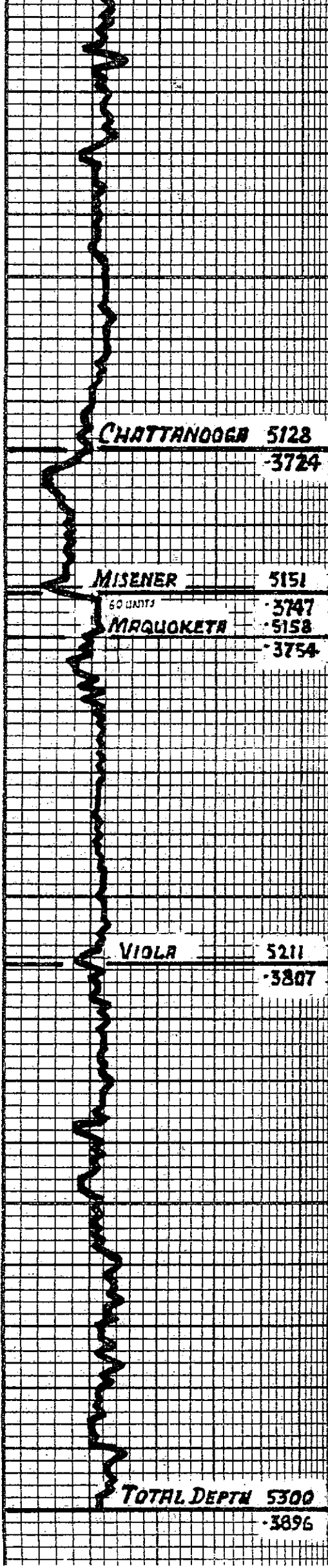
SH. MED. TO BK. GRY & BK. (GRT. IN PART)  
W/ V. SGT. DOLD & IMY. DOLD. AS ABOVE -  
POOR. TALE - NOT REPRESENTATIVE!

SH. MED. GRY. GRY. GRN. BK. W/ TP. GRN.  
& MED. W/ V. SGT. DOLD. IN AS ABOVE  
POOR. SMT.

TAN. GRY. GRY. BRN. EN YNG. TP. SGT.  
YNG. & APRILL. IN PART. TP. GRN. & IT  
GRY. EN YNG. DOLD. PLUS. ADD. MED. BK.  
GRY. BK. & GRY. GRN. SW.

DOLD. AS ABOVE. EN YNG. APRILL. IN PART.  
W/ SGT. BUFE & TAN. EN YNG. SUB-CHLVY.  
PRED DENSE. HARD. IMY. SMT. AS ABOVE

60  
80  
5100  
20  
40  
60  
80  
5200  
20  
40  
60  
80  
5300



SU-MED TO BK GRN BLK SCOT GRN-GRN  
L TO GRN TO SPINTRY TO GRN & MDR  
MIXED IN PART SCOT DOLO AS ABOVE

SU AS ABOVE W/ STN BROWNISH-BLK SIL &  
INCR SPINTRY SH

SU-MED GRN GRN-GRN SCOT BLK TO GRN  
& TO BROWN-BLK AS ABOVE

SU AS ABOVE W/ CHRT LIM & DOLO AS UP  
HOLE-POOR SAMPLES-LOW USE

SU-BLK & BROWN-BLK, COPR (P. GAS  
RIABLES) SIL DOLO BLS & SPARS

(S) SDST-IT GRN W/ BLK SOY'S ENGRAINED  
SUB-ANG TO WELL-RINDS OTT GRN  
FRI. FRI. FOR GAS BUBBLES & THIN  
OIL DROPLETS, WHEN BROKEN (NEED) MERR)  
RIGHT WHITE GOLD FLUR. FRI. ODR

PREP MED TO BK GRN SH W/ GRN-GRN  
W/ RED GRN & BLK SH'S W/ SCOT GRN  
BLUE GRN & TAN EN YIN SUB-CHLKY TO  
DENSE HARD LIM & W/ SCOT W/ L  
F. GRN. PREP FRESH CHRT & TP  
W/ TAIL BK GRN & BKN STN. NO EPAC  
OIL. GRN OR ODR

SAME PREP SU W/ SCOT BK GRN. BLK YIN  
DENSE HARD LIM

PREP SU. SIM GRN. CHLKY IN PART W/ SCOT  
W/ BK GRN & TAN EN YIN SUB-  
CHLKY & TP CHLKY TO DENSE HARD LIM

LIM. W/ CRN. EN YIN. CHLKY & SUB-  
CHLKY IN CRN. BLUE GRN & TAN EN  
YIN. SUB-CHLKY TO DENSE HARD LIM

LIM. W/ CRN. BLUE. LG GRN. TAN & BKN  
EN YIN. CHLKY & SUB-CHLKY TO DENSE &  
HARD - STILL GRN. CALC SH

LIM AS ABOVE W/ LG GRN & TAN W/ SM BK  
SOY'S (MICRO-ORGANISMS). FRESH. TAIL  
CHRT

LIM. CRN. BLUE. LG GRN. EN YIN. SUB-  
CHLKY & IMP. HARD W/ GRN. TAN & BKN. EN  
YIN. V. DENSE. HARD. CHRT & LIM. LIM

(5300) LIM. BLUE. GRN. TAN & BKN. EN YIN. PREP  
V. DENSE. HARD. W/ CHRT AS ABOVE. BLS  
V. SCOT. W/ LG GRN. FRESH. PREP. SUB-  
TRAC. TO COPR. CHRT

**DST No 2 (5143-5158)**  
30-45-90-90  
STRONG BLOW B.O.B. 12 SEC'S  
20 MIN'S 131,000 CF/D  
30 " 138,000 "  
STRONG BLOW B.O.B. (2<sup>nd</sup> OPEN)  
10 MIN'S 158,000 CF/D  
30 " 192,000 "  
50 " 205,000 "  
70 " 144,000 "  
90 " 131,000 "  
REC. 40' MUD W/ TR OF OIL  
151P/2000# F51P/2056 #  
1FP/28-30# FFP/24-29 #  
TEMP = 123°F



STRAIGHT HOLE SURVEY 5158'  
DEVIATION = 3/4°

STRAIGHT HOLE SURVEY 5300'  
DEVIATION = 1°

**CHATTANOOGA 5128**

-3724

**MISENER 5151**

60 UNITS

-3747

**MARQUOKETA 5158**

-3754

**VIOLA 5211**

-3807

**TOTAL DEPTH 5300**

-3896