KIM B. SHOEMAKER

CONSULTING GEOLOGIST

316-684-9709 • WICHITA, KS

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

API: 15-063-22271

COMPANY L. D. DRILLING, INC.

LEASE #2-31 LIMITED

FIELD LUNDGREN

LOCATION 1775' FNL & 2310' FEL

SEC 31 TWSP 19s RGE 29W

COUNTY GOVE STATE KANSAS

CONTRACTOR L.D. DRILLING, INC.

SPUD 11-10-15 COMP 11-21-15

RTD 4388 LTD 4389

MUD UP 3403 TYPE MUD CHEMICAL

ELEVATIONS

KB 2619

DF

GL 2614

Measurements Are All From 2619 KB

CASING

SURFACE 8 5/8" @ 316'

PRODUCTION 5 1/2" @

ELECTRICAL SURVEYS

DUAL IND., DENS-N. MICRO

SAMPLES SAVED FROM 3400 TO 4388

DRILLING TIME KEPT FROM 3200 TO 4388

SAMPLES EXAMINED FROM 3400 TO 4388

GEOLOGICAL SUPERVISION FROM 3600 TO 4388

GEOLOGIST ON WELL KIM B. SHOEMAKER

FORMATION TOPS	LOG	SAMPLES
ANHYDRITE	2019+600	2020+599
B/ANH.	2051+568	2051+568
STOTLER	3252-633	3250-631
HEEBNER	3628-1009	3622-1003
LANSING	3666-1047	3660-1041
STARK	3906-1287	3903-1284
MARMATON	4002-1381	3997-1378
FORT SCOTT	4156-1537	4152-1533
CHEROKEE	4181-1562	4178-1559
MISSISSIPPI SPERGEN	4258-1639	4258-1639

REMARKS

11-10-15 SPUD
11-11 @ 319'
11-12 @ 1550'
11-13 @ 2590'
11-14 @ 3200'
11-15 @ 3750'
11-16 @ 3895'
11-17 @ 3930'
11-18 @ 4115'
11-19 @ 4220'
11-20 @ 4272'
11-21 @ 4388'

LEGEND

Dolomite
Chert
Oolitic
Limestone
Shale
Sandstone
Salt
Anhydrite

REMARKS

SAMPLE DESCRIPTIONS

ANHYDRITE 2020+599

B/ANH. 2051+568

DRILLING TIME IN MINUTES PER FOOT

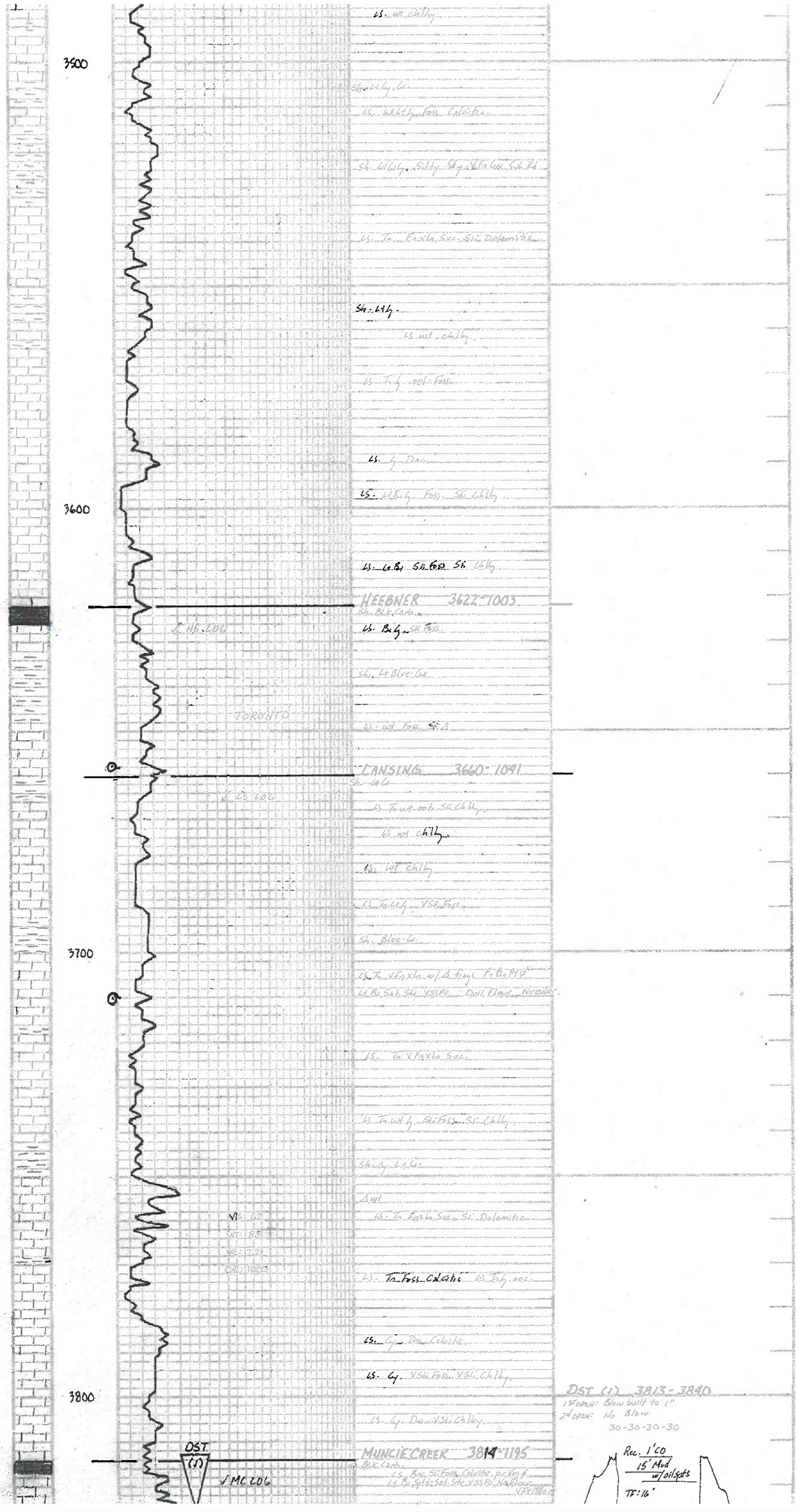
Rate of Penetration Increases

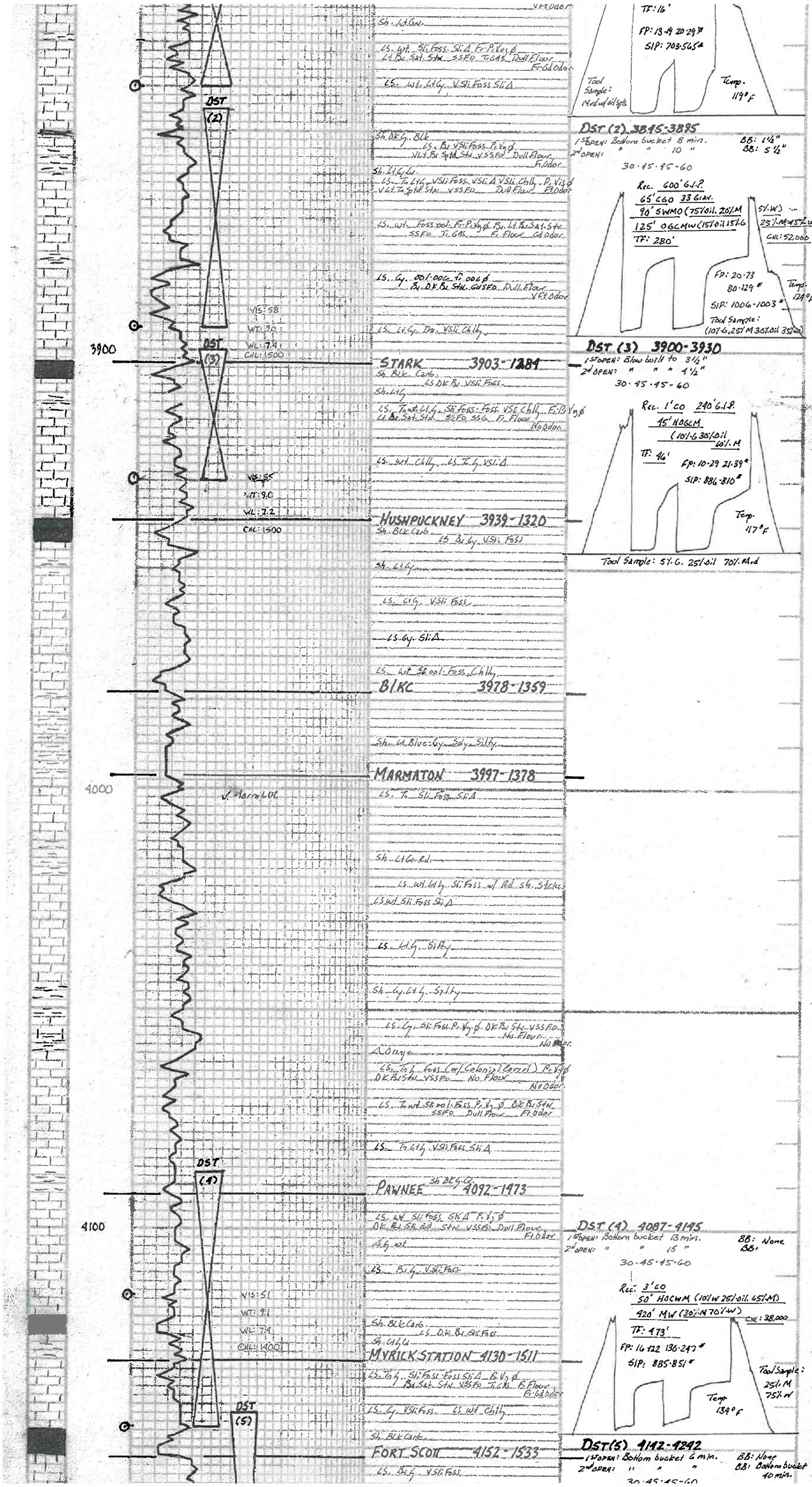
5" 10" 15" 20" 25"

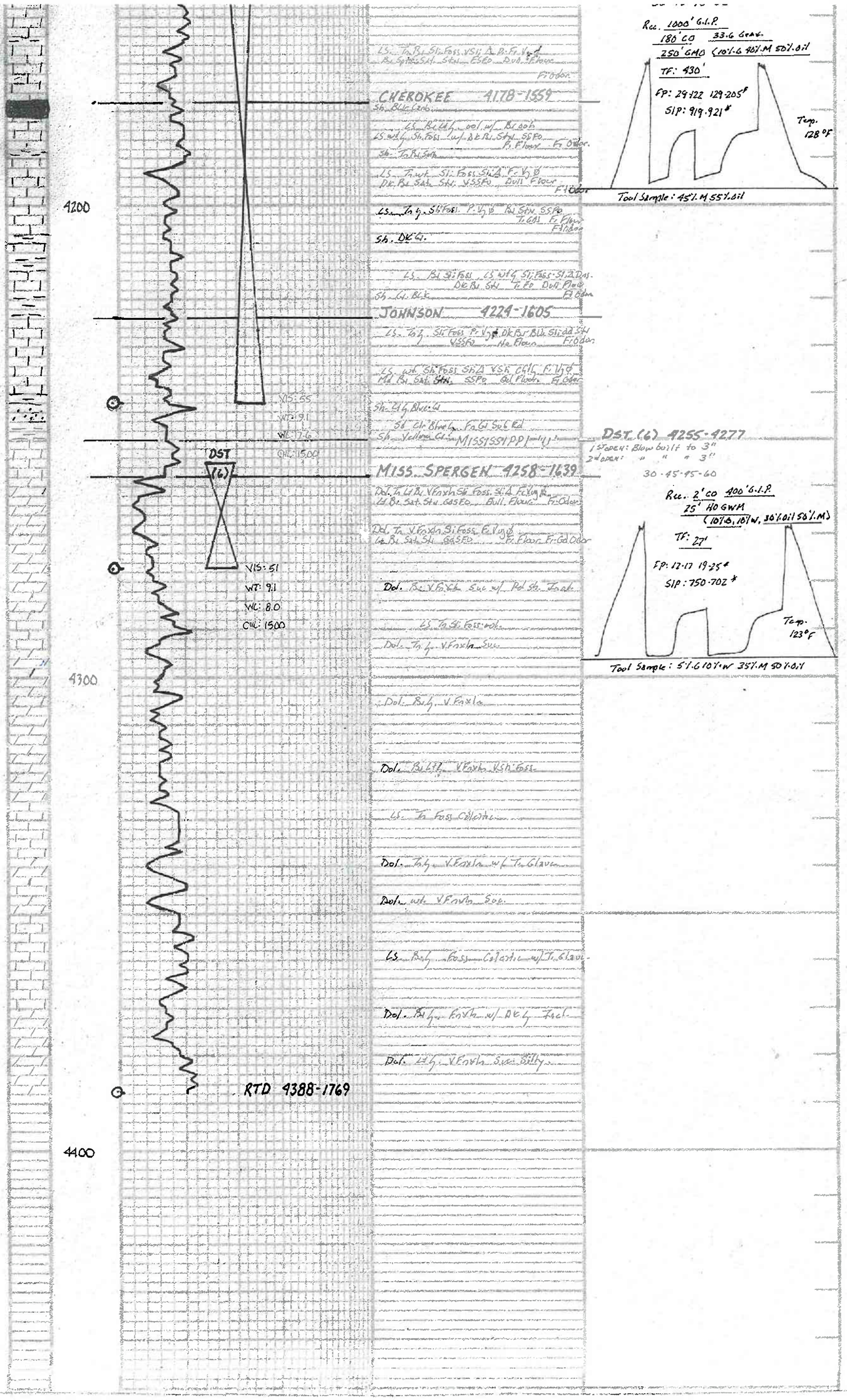
DEPTH 2000 2100

LITHOLOGY

STOCKER 3250-631
Samples acc. to analysed
ls. wh. Sh. foss. Sli. A.
ls. g. Sh. foss.
ls. wh. or Colorless.
ls. wh. Foss. Sh. calcy.
Sh. dk-g.
ls. wh. g. foss. Sli. foss. Colorless.
ls. wh. chalky.
3200
3300
3400


3500
3600
3700
3800
LS. wt. chlky
Sh. Lt Gy.
LS. Wt Gy. Foss. Calcite
Sh. Lt Gy. Silty. Sty. V Fr Gsx. Sch. Fd
LS. To. Fr Xla. Suc. Sli. Dolomitic
Sh. Lt Gy.
LS. wt. chlky.
LS. To. Gy. ool. Foss.
LS. Gy. Dns.
LS. Lt Gy. Foss. Sli. Chlky.
LS. Lt Bu. Sli. Foss. Sli. Chlky.
HEEBNER 3622' -1003
Sh. Blk. Carb.
LS. Bu Gy. Sli Foss.
Sh. Lt Blue. Gx.
LS. wt. Foss. Sli A.
TORONTO
LANSING 3660' -1091
Sh. Gy.
LS. To. wt. oob. Sli. Chlky.
LS. wt. chlky.
LS. wt. chlky.
LS. To. Gy. V Sli. Foss.
Sh. Blue. Gy.
LS. To. V Fr. Xla. w/ A. Frags. Pr. Fr. P.P.
Lt Bu. Sat. Sh. V Sli Fo. Dull Fluor. No odor.
LS. To. V Fr. Xla. Suc.
LS. To. wt. Gy. Sli. Foss. Sli. Chlky.
Sh. Gy. Lt. Gy.
A. wt.
LS. To. Fr. Xla. Suc. Sli. Dolomitic.
LS. To. Foss. Calcitic. LS. To. Gy. oolic.
LS. Gy. Dns. Calcitic.
LS. Gy. V Sli. Foss. V Sli. Chlky.
LS. Gy. Dns. V Sli. Chlky.
MUNCIE CREEK 3814' -1195
Blk. Carb.
LS. Bu. Sli. Foss. Calcitic. pr. Vug. P.
Lt Bu. Spld. Sat. Sh. V Sli Fo. No Fluor.
V Fr. Odor
HB. LOG
LS. LOG
MC. LOG
VI: 62
VI: 89
VI: 72
CAL: 1900
DST (1)
DST (1) 3813 - 3840
1st OPEN: Blow built to 1"
2nd OPEN: No Blow
30-30-30-30
Rec. 1' CO
15' Mud
w/ oil spts
TF: 16'


DST (2)
DST (3)
DST (4)
DST (5)
3900
4000
4100
VIS: 58
WT: 9.0
WL: 7.4
CHL: 1500
VIS: 55
WT: 9.0
WL: 7.2
CHL: 1500
VIS: 51
WT: 9.1
WL: 7.4
CHL: 1400
STARK 3903-1284
HUSHPUCKNEY 3939-1320
BLKC 3978-1359
MARMATON 3997-1378
PAWNEE 4092-1973
MYRICK STATION 4130-1511
FORT SCOTT 4152-1533
TF: 16'
FP: 13-49 20-29#
SIP: 703-565#
Tool Sample: Mud w/ oil specks
Temp. 119°F
DST (2) 3845-3885
1st OPEN: Bottom bucket 8 min.
2nd OPEN: " " 10 "
BB: 1½"
BB: 5½"
30-45-45-60
Rec. 600' G.I.P.
65' CGO 33 GRAV.
90' SWMO (75% oil, 20% M
125' OGCMW (15% oil 15% G
TF: 280'
5% W
25% M-45% W
CHL: 52,000
FP: 20-73
80-129#
SIP: 1006-1003#
Temp. 124°F
Tool Sample: (10% G, 25% M 30% oil 35% W)
DST (3) 3900-3930
1st OPEN: Blow built to 3½"
2nd OPEN: " " " 4½"
30-45-45-60
Rec. 1' CO 240' G.I.P.
15' HOCM
(10% G 30% Oil
60% M
TF: 46'
FP: 10-29 21-39#
SIP: 886-810#
Temp. 117°F
Tool Sample: 5% G. 25% oil 70% Mud
DST (4) 4087-4145
1st OPEN: Bottom bucket 13 min.
2nd OPEN: " " 15 "
BB: None
BB:
30-45-45-60
Rec: 3' CO
50' HOCWM (10% W 25% oil 65% M)
420' MW (30% M 70% W)
CHL: 38,000
TF: 47.3'
FP: 16-122 136-247#
SIP: 885-851#
Tool Sample: 25% M 75% W
Temp 134°F
DST (5) 4142-4242
1st OPEN: Bottom bucket 6 min.
2nd OPEN: " " "
BB: None
BB: Bottom bucket 40 min.
30-45-45-60


4200
4300
4400
CHEROKEE 4178-1559
JOHNSON 4224-1605
MISS. SPERGEN 4258-1639
RTD 4388-1769
DST (6)
VIS: 55
WT: 9.1
WL: 7.6
CWL: 1500
VIS: 51
WT: 9.1
WL: 8.0
CWL: 1500
Rec. 1000' G.I.P.
180' CO 33.6 Grav.
250' GMO (10%.G 40%.M 50%.Oil
TF: 430'
FP: 29-122 129-205#
SIP: 919-921#
Temp. 128°F
Tool Sample: 45%.M 55%.Oil
DST (6) 4255-4277
1st open: Blow built to 3"
2nd open: " " " 3"
30-45-45-60
Rec. 2' CO 400' G.I.P.
25' HO GWM
(10%.G, 18%W, 30%.Oil 58%.M)
TF: 27'
FP: 12-17 19-25#
SIP: 750-702#
Temp. 123°F
Tool Sample: 5%.G 10%.W 35%.M 50%.Oil