

TERRY HALL, D.D.
 Consulting Geologist
 P.O. Box 505
 Wichita, Kansas 67201
 316-205-6431

GEOLOGIST'S REPORT
 DRILLING TIME AND SAMPLE LOG

OPERATOR Ritchie Exploration, Inc.
 LEASE Kollman WELL NO. 124D
 FIELD _____
 LOCATION 1845' ESL & 985' FEL
 SEC. 24 TWP. 17S RGE. 35 W
 COUNTY Michigan STATE KANSAS

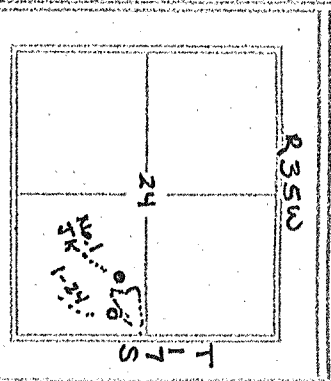
CONTRACTOR WUW - Big No. 2
 CORNER 3-18-2013 COMP. 3-28-2003
 ETD 5035' LOG TO 5036'
 SAMPLES SAID FROM 3700' TO RTD
 DRILLING TIME KEPT FROM 3500' TO RTD
 SAMPLES EXAMINED FROM 3700' TO RTD
 GEOLOGICAL SUPERVISION FROM 3550' TO RTD
 RUN UP 3400' TYPE LOG CHEMICAL

FORMATION	TOP	LOG	MEASUREMENT	TOP	MEASUREMENT	STRAT. CORRECT.
Anhydrite	2441	+ 723	2443	+ 721	-7	
Base-Anh	2442	+ 702	2463	+ 701	-2	
Stortler	3630	- 466	3631	- 467	-4	
Heebner	4018	- 854	4016	- 852	-7	
Lansing	4065	- 901	4064	- 900	-7	
Muncie Creek	4249	- 1085	4252	- 1088	-4	
R-KC	4438	- 1274	4431	- 1273	-7	
Altamont	4505	- 1341	4498	- 1334	-11	
PAWNEE	4590	- 1426	4589	- 1425	-12	
QUEROKEE SH.	4668	- 1504	4666	- 1502	-10	
Johnson Zn	4778	- 1614	4776	- 1612	-8	
Morrow	4812	- 1648	4812	- 1648	-6	
Mississippi	4916	- 1752	4816	- 1752	-38	

ELEVATION
 KB 3164
 DF 3159
 Measurements Are All From KB.

CASING RECORD
 SURFACE 8 5/8" at 226'
 PRODUCTION 4 1/2"

ELECTRICAL SURVEYS
 Na-bor's Prod.
 Dual Induction
 Density Neutron
 R35W



REFERENCE WELL FOR STRATIGRAPHIC CORRELATION
Ritchie Exploration Inc. # 1
J. Kollman - 2050' ESL & 1655' FEL - Sec 24 - 17S - 35W - 3172 KB

LOG	DEPTH	DESCRIPTION	LOG	DEPTH	DESCRIPTION
3-18-13	1127'	MIET - Set surf - Gg	A	12 1/4	SMITH
3-19-13	1750'	d-19			M2517
3-20-13	3080'	d-19	1	7 7/8	SMITH
3-21-13	3960'	d-19	2		F-27
3-22-13	4110'	d-19	3		5035
3-23-13	4190'	d-19	4		
3-24-13	4376'	d-19	5		
3-25-13	4520'	d-19	6		
3-26-13	4580'	d-19	7		
3-27-13	4885'	d-19	8		
3-28-13	5035'	E-log - Rpe 9	9		

FORMATION	DEPTH	DESCRIPTION
Lansing "C"	4102 - 4110'	Limestone, tan, fine-xln, foss w/ 3 pcs per tray w/ dark brown-black stain in scath
Lansing "D"	4119 - 4140'	Yogurt of VSS FO + faint odor ls. tan - gray - fn - xln. foss w/ 3-5 pcs w/ fair light-med. brown stain + sfs in fair ph. foss of "SKUNKY" odor
Lansing "E"	4170 - 4175'	Limestone, fn-xln, foss w/ 4-5 pcs w/ dark brn-blk heavy free oil in fair pp - foss of spotted salt + faint odor
Lansing "F"	4179 - 4196'	Limestone, tan, gray, trace xln. foss w/ 4-5 pcs w/ med. brown spotted salt + fair pp. foss of faint odor
Lansing "H"	4264 - 4271'	SFO in fn poor punpoint of - fair odor
Lansing "I"	4298 - 4308'	Limestone, tan, fn-xln, foss w/ 6 pcs w/ med brown stain + sfs. in fair
Lansing "J"	4328 - 4346'	ls. tan. foss - cal - med. w/ sev. pcs w/ fair brown oil sfs + sfs. in fair
Lansing "K"	4370 - 4381'	ls. tan. fn-xln + foss of salt + sfs. in w/ med. dk brown sft + salt + sfs. in w/ med. dk brown sft + salt + sfs. in
Lansing "A"	4510 - 4520'	limestone, tan, fn-xln, sfs, foss w/ 3-4 pcs w/ med brown stain + salt + sfs. in poor foss of faint odor
Altamont "B"	4540 - 4545'	ls. cream w/ med brown stain + salt + sfs. in fair herodetic, fair odor
Mississippi	4906 - 4916'	SS. clg, quartzic, sub ang. fn. m. q. nod clusters w/ sfo + faint odor in fr. q. nod

DRILL STEM TESTS

No.	Interval	SP/Min	IS/Min	FR/Min	REQ/Min	LOG/Min	REMARKS
1	4085'-4110' 25'	4'-43" 30"	782# 45"	43-69# 45"	773# 60"	1957# 1953#	70' wcm 34% wtr 65' mud 84% wtr 135' Fluid
2	4110'-4140' 30'	5'-269# 30"	1097# 45"	272-451# 45"	1092# 60"	1933# 1932#	410' mud 70% wtr 570' mud 97% wtr 980' Total Fluid
3	4146'-4190' 44'	6'-52" 36"	1102# 45"	55-83# 45"	1095# 60"	1969# 1966#	170' wcm 75% m
4	4239'-4306' 67'	8'-70" 30"	1174# 45"	73-100# 45"	1154# 60"	2033# 2033#	10' 50 wcm 4% o - 38% wtr 190' wcm 21% wtr 200' Fluid
5	4351'-4390' 39'	31-240# 36"	1089# 45"	391# 30"	1087# 60"	2101# 2095#	20' C.D. + 60mud 210' mcmw 255' sctmcm 355' mud
6	4445'-4520' 75'	9'-38" 30"	1178# 45"	42-69# 45"	1156# 60"	2113# 2112#	15' oil sp'd mud 100% m 125' wcm 20% wtr 140' total Fluid
7	4522'-4550' 28'	5-22" 30"	382# 45"	24-46# 45"	379# 60"	2145# 2143#	65' oil sp'd mud 100% mud
8	4890'-4917' 27'	7-32" 30"	985# 45"	38-60# 45"	956# 60"	2372# 2365#	1' F.O. 26% 124' ocm 39% oil 125' Fluid

with the success on some dsts and potential for injection well the Kollman 1-24D is running 4 1/2" production casing to further evaluate.

Respect Fully

Jeff R. Head
petroleum geologist
3-28-2013

LEGEND

Anhydrite	Salt	Sandstone	Shale	Carb sh	Limestone	Oal.Lime	Chert	Dolomite

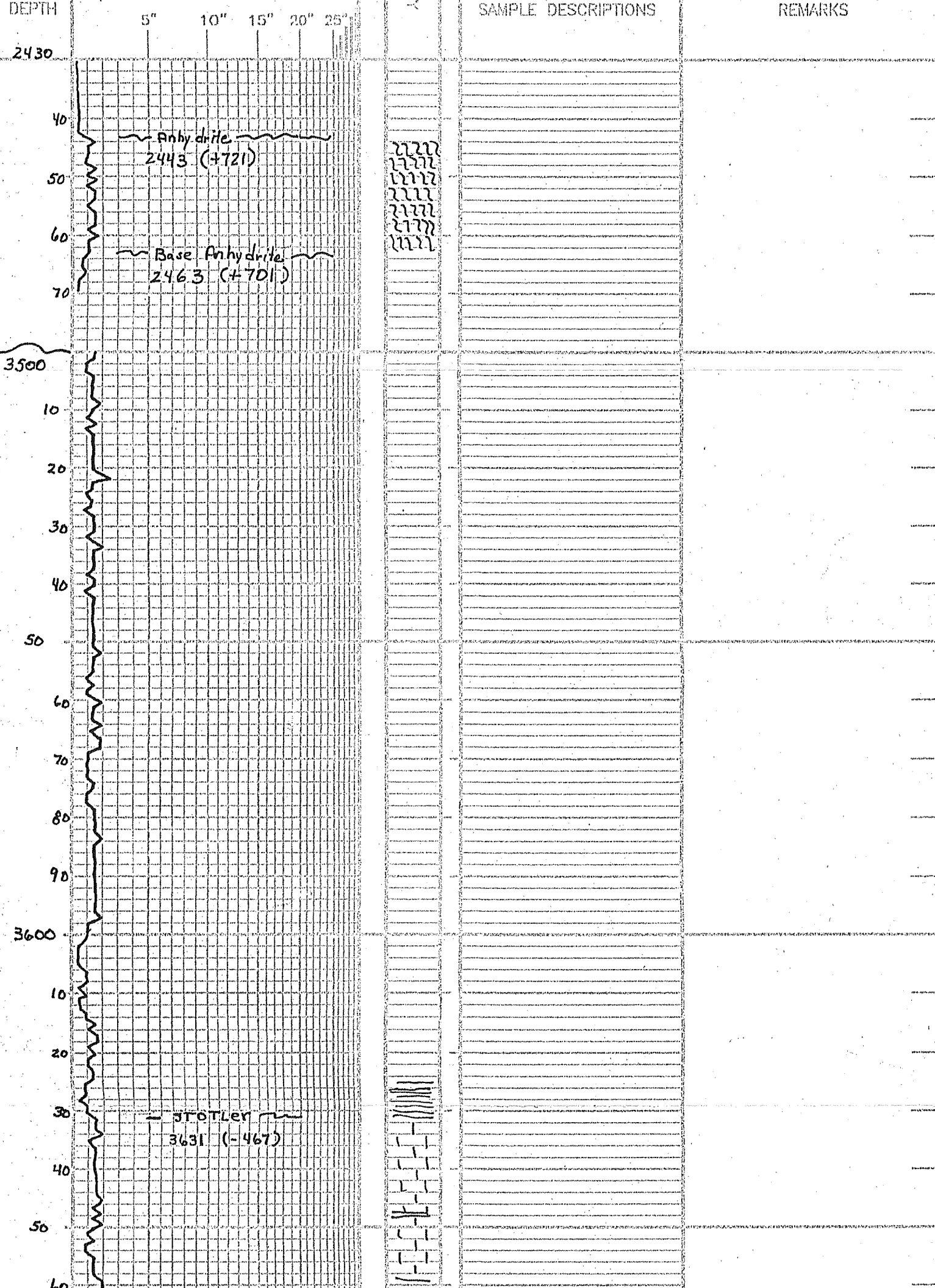
SCALE = 100'

DRILLING TIME IN MINUTES

PER FOOT

Rate of Penetration Increases

1 - 3 THOLOG



70
80
90
3700
10
20
30
40
50
60
70
80
90
3800
10
20
30
40
50
60
70
80

Begin 10' samples



sh. gry-mar-red

ls. Crm-wh, fn-xln - foss
-sl ool, scatt p. N.S., Chky

ls. Crm-wh, fn-xln + slt
foss, Chky, N.S.

sh. gry-mar

ls. Crm-wh, fn-xln, Chky
N.S.

sh. varicolored

ls. Crm + Gry, fn-xln, v slt
foss, Chky, N.S.

ls. q/a, Crm-Gry, fn-xln N.S.

shale, gry-red-mar

ls. Crm + Gry, fn-xln +
Chky, N.S.

sh. gry-MAR

ls. Crm-Gry, fn-xln - v shly

sh. gry-MAR-red

ls. Crm, some Gry, fn-xln
tight Rx, Chky, N.S.

ls. q/a - becoming shly
also ls. tan-brn. fn-xln
slt foss - N.S.

sh. gry.s.-red-mar

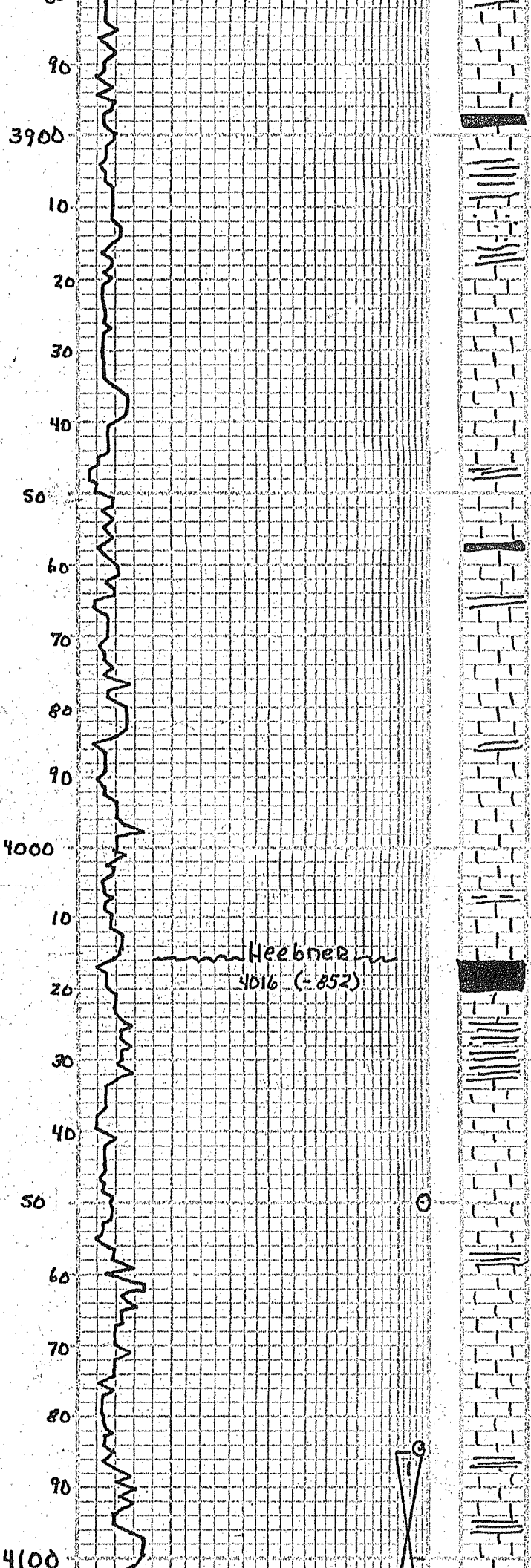
ls. Crm-wh-gry, fn-xln
tight - Chky.

sh. gry-MAR

ls. Crm-Gry, fn-xln, slt foss
Chky, pr. N.S.

DST NO1 4085'-4110' "C" in
wk inc blow + 2" both opens
30" 45" 45" 60"

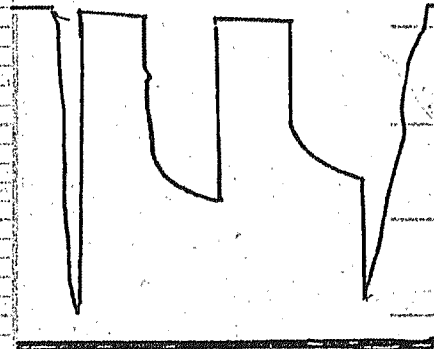
Rec: 70' wcm 34% wtn
65' mw 84% wtr
135' Fluid



sh. bit carb
 ls. tan. fn-xln. sil foss -
 scat fr p. N.S.
 sh. gry. mar.
 ls. tan. fn-xln. foss w/
 fr. foss. p. N.S. ? odor
 ls. qtz tan. fn-xln. foss. fr. p
 N.S. ? odor.
 ls. tan. fn-xln. foss. pr
 foss. p. N.S., Chky
 sh. bit carb
 ls. tan. fn-xln. foss. pr p
 N.S. Chky.
 sh. gry. mar.
 ls. tan. fn-xln. sil. ool. tight
 rx. N.V.D. N.S.
 sh. gry. mar.
 ls. tan. fn-xln. foss w/ fr
 foss. p. N.S. Chky
 ls. tan. fn-xln. foss w/
 fair foss. p. Chky N.S.
 sh. bit carb
 ls. tan. brn. fn-xln. tight rx
 N.S.
 sh. gry. mar.
 ls. tan. fn-xln. foss w/
 fair foss. p. N.S. No odor.
 ls. qtz tan. foss w/ qd p.
 N.S. No odor
 sh. dk gry
 ls. H. tan. fn-xln. sil. suc
 w/ scat. xln. suc. p. N.S.
 No odor
 ls. tan. fn-xln. suc w/
 scat. xln. suc. p. N.S. No
 odor.
 ls. tan. fn-xln., fr p
 N.S.
 sh. gry.

SIP: 782[#] - 773[#]
 FP: 4[#] - 43[#] + 43[#] - 69[#]
 HP: 1957[#] - 1953[#]

DST # 1



DST No. 2. 4110' - 4150' "D"

Bob 7 1/2" 1st op NBB + 8 1/2" 2nd

30" 45' 30" 45"

REC: 410' mcw 70% wtr

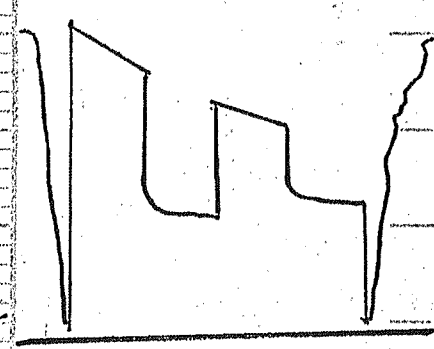
570' mcw 97% wtr

980' TOTAL FLUID

SIP: 1097[#] - 1092[#]

FP: 15[#] - 269[#] + 272[#] - 451[#]

HP: 1933[#] - 1932[#]



DST No. 3 4146' - 4190' "E-F"

wk inc 3" 1st op, wk inc 4" 2nd op

30" 45" 45" 60"

Rec: 170 w m 75% m

SIP: 1102[#] - 1095[#]

FP: 6[#] - 52[#] + 55[#] - 83[#]

HP: 1969 - 1966[#]

10
20
30
40
50
60
70
80
90
4200
10
20
30
40
50
60
70
80
90
4300
10
20



ls. tan. fr. xln. foss. 3 pcs w/ drk. blk. stn + v. ss fo + faint odor
fr ls. v. shly.

ls. tan. fr. xln. foss. 3-4 pcs w/ lt. spid. f.o. + shn in pr. foss. "Skunky" odor

ls. tan. Crm. fr. xln. foss. w/ 4-5 pcs w/ lt. med spid sat + ss fo, skunky odor in fair ph. foss

ls. tan. fr. xln. foss. - N.S.

sh. blk. drk. GRY - MAR

ls. tan. fr. xln. v. scl. foss N.S.

ls. tan. - gry. fr. xln. - dse scl. sh. N.S. No odor

ls. tan. fr. xln. foss. 4-5 pcs w/ drk. gry. hue. f.o. in fr. pp. foss. faint odor, spid sat

ls. tan. gry. fr. xln. foss. 4-5 pcs w/ med brn. sat. sh. + spid in fr. pp. foss. faint odor

shly. GRY - MAR

ls. lt. tan. crm. fr. xln. - scl ool w/ fr. ool. sh. CHKY

ls. lt. tan. - crm. fr. xln. - scl ool w/ pr. ool. sh. N.S. v. CHKY

ls. lt. tan. - crm. fr. xln. - ool. 1-2 pc w/ dds. in poor v. sh. N.F.O. No odor. CHKY

ls. lt. tan. - crm. fr. xln. - scl ool. + tight rx. N.S. CHKY

sh. blk. carb.

ls. tan. fr. xln. - tight rx N.S.

ls. tan. fr. xln. foss. w/ 4-5 pcs w/ drk. brown. stn + fr. sat + f. pr. sso. in fr. pp. FAIR odor.

ls. tan. fr. xln. sh. foss 3-4 pcs w/ sso. in fr. pp. faint odor

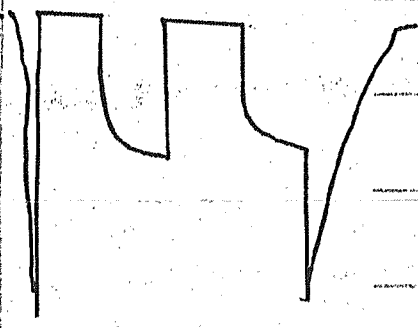
sh. blk. Carb

ls. tan. fr. xln. - scl. foss. - N.S. No odor. sh. GRY.

ls. tan. fr. xln. - foss w/ 3-4 pcs w/ med brn. f.o. and qd sat in fr. pp. FAIR odor

ls. tan. fr. xln. - tight rx N.S.

sh. GRY - MAR

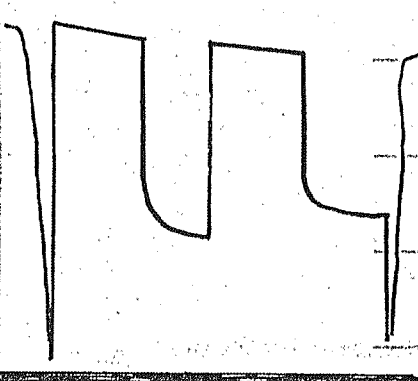


DST NO. 4 4239' - 4306' "H-I"

1st wk inc to 4 1/2" 1st open NBB
2nd wk inc to 5" 2nd open NBB
30" 45" 45" 60"

Rec: 10' 30" wcm 4% oil + 38% wtr
190' wcm 21% wtr
200' FLUID

SIP: 1174* - 1154*
FP: 8* - 70* + 73* - 100*
HP: 2033* - 2033*



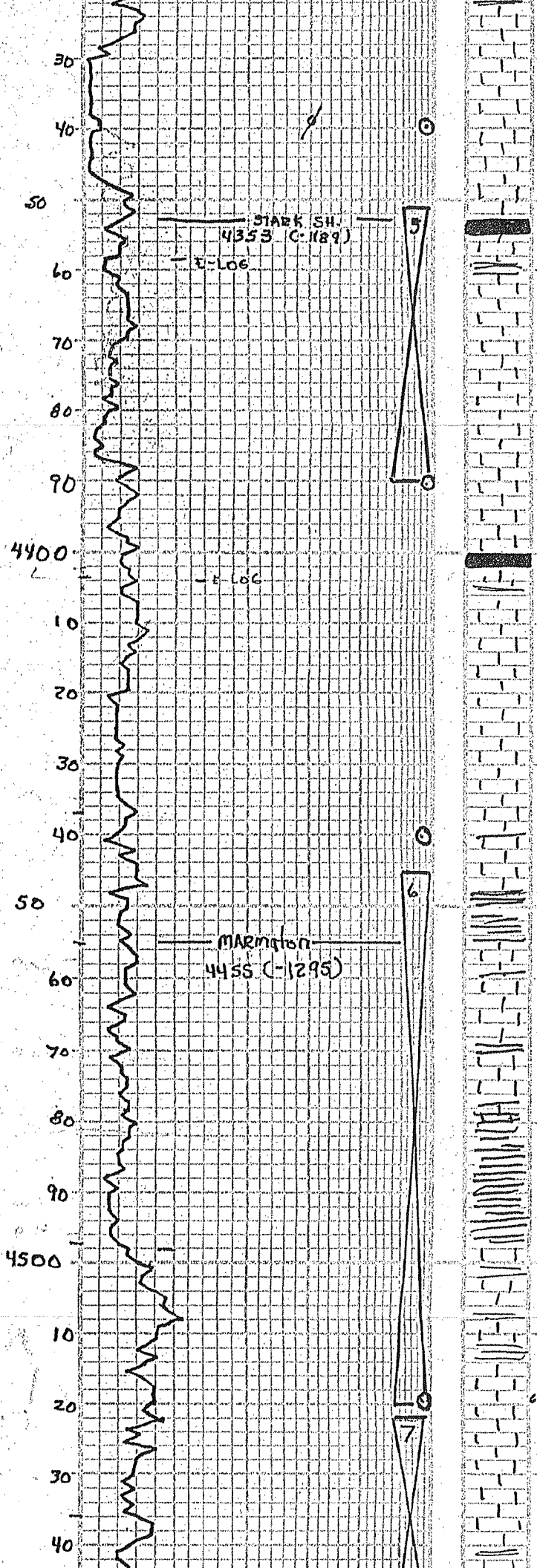
DST NO. 5 4351 - 4390' "K"

1st op. 6 1/2" - 80B, 2nd op 8 1/2" - 80B.
30" 45" 30" 60"

Rec: 20' C.O.
210' mcw 53% oil
255' sot mcw 5% oil
315' mcw 3% mud
60' mw 38% mud
840' Total Fluid

SIP: 1089* - 1087* #p 2101*
FP: 37* - 240* + 256* - 391* 2075*
DST # 5"

MUNCIE CRK
4248 (1084)



ls. tan. fn. xln + foss 7 col w/ fr. brn oil + sat in fr. f. foss - col. p. fair odor

ls. tan. H. brn. col. r. coc. w/ sev. pc's w/ lt. md. brn. fr. at sat. faint odor.

SH-BK CARB

tr. med. ls. N.S.
SH. gray-mar

ls. tan. fn. xln + foss w/ 6-7 pc's w/ med. drk brn fr. and spt. d. sat. in fr. p. foss. p. fair odor

ls. tan. fn. xln + foss - sli col w/ 4-5 pc's w/ drk brown sat. str. and sfo in fr. foss - col. p., faint odor

SH-BK Carb.

ls. tan. fn. xln - dse, sli foss matrix, PR - N.V.P. N.S.

ls. tan. fn. xln - dse, sli foss - N.V.P. N.S. tr. Δ

ls. tan. fn. xln - dse, sli foss tr. Δ, N.S.

ls. tan. fn. xln - dse, sli N.S.

tr. gray-mar shale

ls. tan + brn. fn. xln. foss v. poor. foss. p. + 19 ht. R.N. N.S.

ls. TAN-BRN - dse N.S. + Sh
SH - BK - GRAY - MAR

ls. tan - brn. fn. xln - dse v. sli foss - N.V.P. N.S.

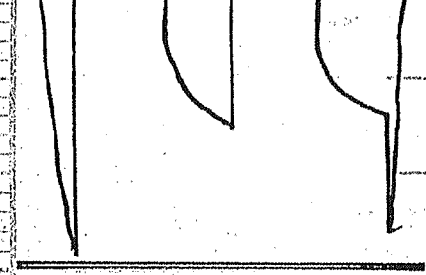
sh. var. colored

sh. var. colored

ls. tan. fn. xln. sli foss sli. fair lt. gray str. + sfo in fr. xln. + foss. p. faint odor

60' ls. tan. fn. xln. sli foss - 3-4 pc's w/ med. brn spt. d. str. + sfo in poor foss. p. faint odor.

ls. Cym. tan. calcic. w/ 5-6 pc's w/ med. brn spt. d. sat. str. + sfo in fr. inter. col. p.

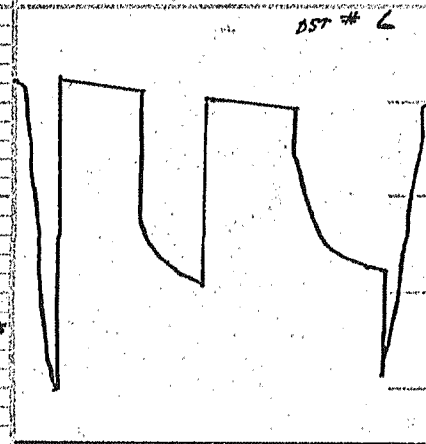


DST No. 6 4445' - 4520' RH "A"
WK - 2 1/4" 1st op + w - 1 1/2" 2nd

30" 45" 45" 60"

Rec: 15' sli oil spt'd mud
100% m
125' wcm 20% w
140' Total Fluid

SIP: 1170# - 1156#
FP: 9# 38" + 42" - 69"



DST No. 7 4522' - 4550' "B"
WK blow 1 1/2" 1st op - 1/2" 2nd op

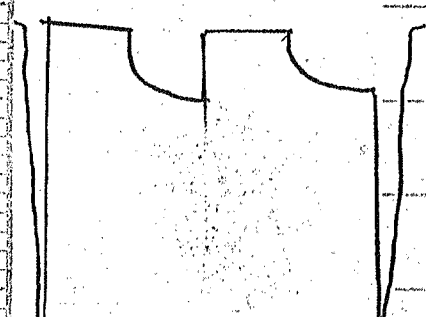
30" 45" 45" 60"

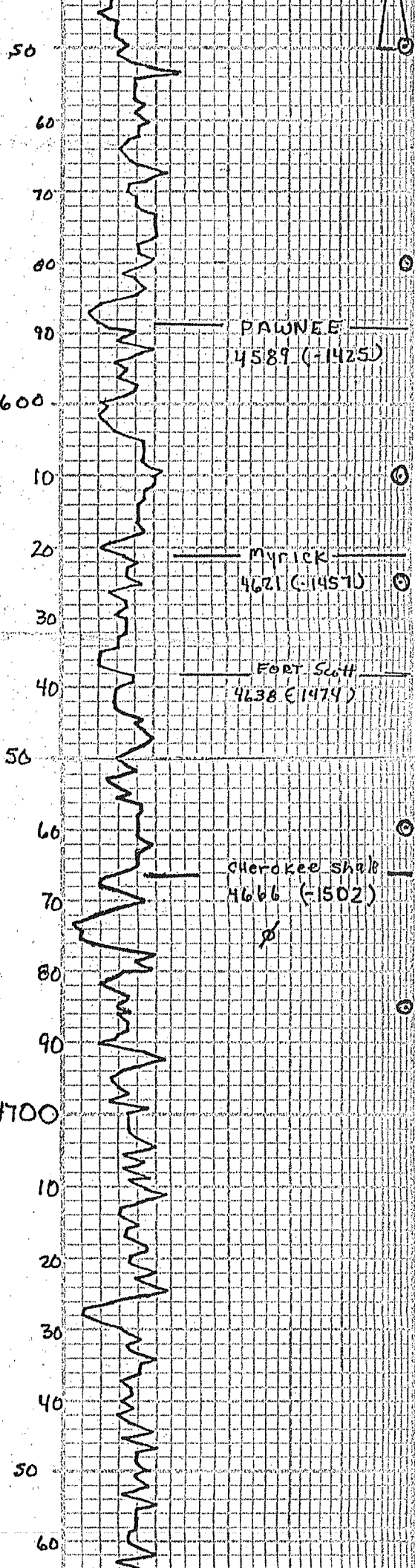
Rec: 65' oil spt'd mud
100% m.

SIP: 382# - 379#

FP: 5# - 22# + 24-46#

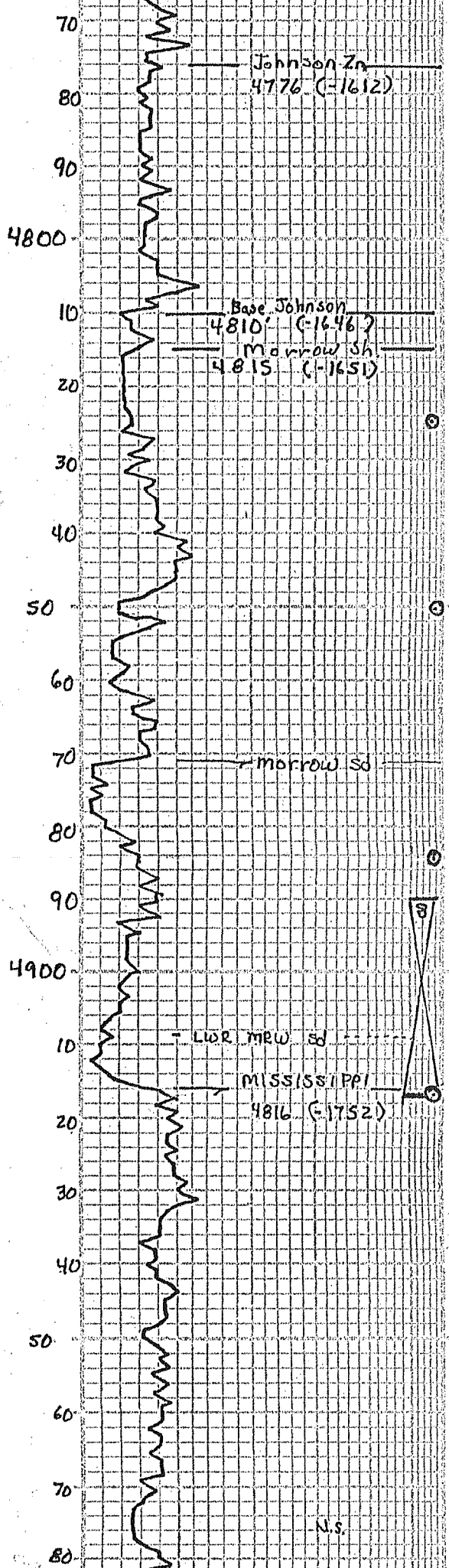
HP: 2145# - 2143#





Sh. gry-mar
 Ls. tan-gry-fn-xln-dse
 Sci foss, N.V.P., N.S.
 Ls. lt tan fn-xln-sil
 foss-tight rx, PR-N.V.P.
 N.S.
 Ls. lt-tan-H brn, fn-xln
 tight rx-N.V.P. N.S.
 sh-drk gry
 Ls. BRN FN-XLN-DSE w/
 foss-ool MATRIX, tight
 PR φ. N.S.
 2 SH-DRK GRY-MAR.
 Ls. lt-brn-brn, fn-xln +
 dse, foss-matrix, tight
 rx, N.S. No odor
 SH-BLK-GRY-MAR
 Ls. tan-brn, fn-xln: foss
 tight rx, N.S.
 Ls. tan, fn-xln-dse, N.V.P.
 N.S.
 SH-BLK CARB
 Ls. tan-brn: fn-xln-sil
 foss tight-N.S.
 Ls. tan-brn, fn-xln, sil foss
 sil ool MATRIX, N.S.
 sh. blk Carb
 Ls. tan-brn, fn-xln + ool
 dse, w/ gd ool MATRIX to
 rx, PR φ. N.S.
 Ls. tan-brn, ool matrix
 w/ scatt pr ool of 7 ok
 ool φ. N.S.
 Ls. tan-brn, ool w/ scatt pr φ.
 N.S.
 shale, black carb.
 Ls. tan, fn-xln: foss →
 sil ool, scatt φ. N.S.
 Ls. tan, fn-xln-foss-sil
 matt- some granular ls.
 N.S.
 sh. drk Gry
 Ls. tan-gry, fn-xln-foss
 scatt matt foss φ N.S.
 sh. drk Gry-GM-MAR
 Ls. lt brn, fn-xln-foss
 scatt φ. N.S.
 sh. med-drk Gry
 Ls. tan-brn, fn-xln-dse
 v. sil foss, tight rx, N.V.P.
 N.S.
 sh. drk Gry
 Ls. tan-H brn, fn-xln-sil
 foss-v sil ool, pr φ. N.S.
 Ls. tan + brn, fn-xln-dse
 v. sil foss w/ poor foss φ
 N.S.
 sh. drk Gry
 Ls. tan + brn, fn-xln +
 sil foss v. sil ool N.S.

DST No 8 4890-4917 Miss of
 w/ blow 1 1/2" 1st op + 2 1/4" 2nd op
 30" 45" 45" 60"
 Rec: 1' mail 99% oil
 124' mail 39% oil
 125' Fluid
 SIP: 985# - 956 #
 FP: 7#-32# + 38#-60#
 #P: 2372# - 2365#
 dst no 8



Ls. tan - H. brn. fn. xln. v. sli
foss - NVB, sli CHKY. N.S.

sh. drk Gry

Ls. tan - brn. fn. xln - dse
HED + TIGHT. RX, NVB
N.S. sli CHKY

Ls. tan - GRAY - BRN, fn. xln
- dse, sli FOSS, some Grq
fr. PR FOSS. N.S.

Ls. tan - brn, fn. xln - dse
sli FOSS, tr. P. N.S. NO
odor.

Ls. tan - brn, fn. xln, sli FOSS
tight rx, PR. N.S. NO odor.

sh. gry - grn - drk Gry.

sh. gry's - grn, N.S.

sh. gry - drk Gry, N.S.

Ls. tan, lse, NVB
N.S.

ss. dr., quartzic, fn. - grnd
calc. con. - glauc. - N.S.
+ alot. of gry. shales.

Ls. tan, fn. xln - anq. - no
real p. N.S.

ss. loose, quartzic, sub ang
grms. - No. shales. + some
L. brn - tan, ls. tight pr. - NVB
N.S.

Ls. tan + brn, fn. xln - sli ool
matrix to dse, NVB. N.S.

SALV

Ls. tan - brn, fn. xln - sli
ool tight rx. N.S.

ss. quartzic, fn. - md. grnd clusters
v. friable, w/ drk brow. FO.
in fr. intergru. p. faint ool

ss. quartzic, fn. - grnd, friable
clusters, 2-3 pc's w/ s.o., bot
mostly barren. Lt. tan - brn
fn. xln - sli. foss. N.S. Lots
of caving sh.

Ls. brn, fn. xln - dse, sli
foss. matrix, NVB. N.S.
tr. eye.

tr. sd. stone, wh. dr. N.S.

Ls. tan - brn, fn. xln -
sli ool to dse, w/ NVB
N.S.

sh. black - Ven colored +
Ls. q/a N.S.

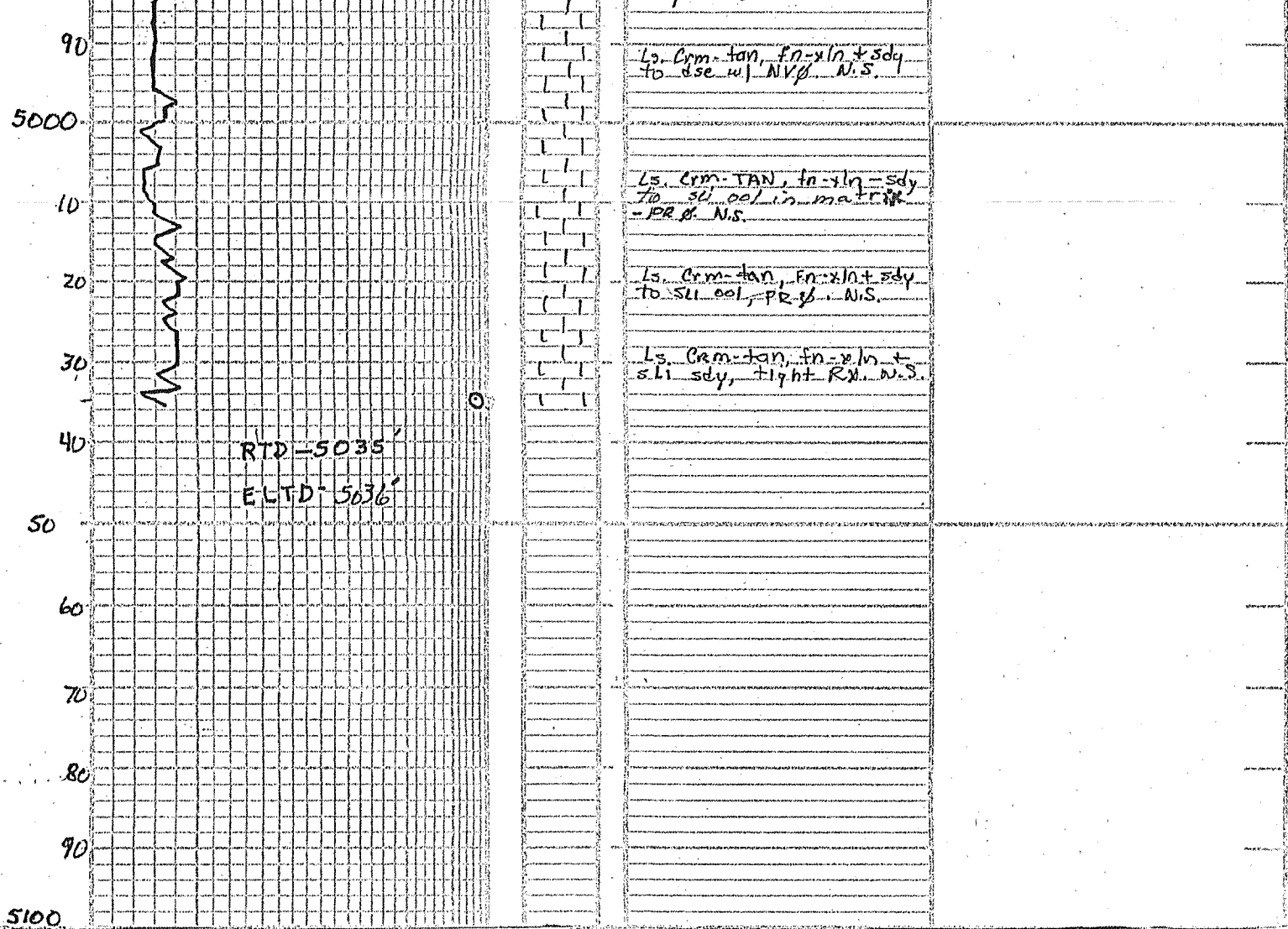
Ls. Crm. fn. xln + ool in
matrix, N.S. sli CHKY

Ls. Crm - Lt. tan, fn. xln
sdy matrix + v. sli
foss - sli CHKY. N.S.

Ls. Crm - Lt. tan, fn. xln +
sdy. CHKY. N.S.



sh. cavings from Morrow



DEPTH	DRILLING TIME Minutes/Foot	LITHOLOGY	SAMPLE DESCRIPTIONS	REMARKS
	<div style="display: flex; justify-content: space-around;"> 5" 10" 15" 20" 25" </div> <p style="text-align: center;">Rate of Penetration Increases</p>			

COMPANY Ritchie Exploration, Inc

LEASE Kollman 1-24 D

ELEVATION: 3164' K.B.

LOCATION 1845' ESE 1/4 985' REL SEC 24 TWP 17S RNG 35W

COUNTY Wichita STATE Kansas