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GEOLOGIC REPORT LOG

COMPANY **MURFIN DRILLING CO.**

WELL **BURK TRUST 'J' #1-25**

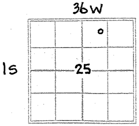
FIELD

LOCATION **610' FNL 1590' FEL**

SEC **25** TWSP **1S** RGE **36W**

COUNTY **RAWLINS**

STATE **KANSAS**



PRODUCTION:

ELEVATION: KB 3255
DF
GL 3245

DRILLING MEASURED FROM

MUD COMPANY MORGAN MUD INC
CONTRACTOR MURFIN DRLG CO RIG # 14
COMMENCED 14 FEB 2014 COMPLETED

CASING RECORD:
SURFACE 8⅝ @ 264' PRODUCTION
TOTAL DEPTH DRLR. 4780
TOTAL DEPTH LOG 4781

SAMPLES SAVED FROM 10' - 3540 TO TD
DRILLING TIME KEPT FROM 1' - 3540 TO TD
SAMPLES EXAMINED FROM 3540 TO TD
GEOLOGICAL SUPERVISION FROM 3500 TO TOTAL DEPTH
DRILL STEM TESTS TRILOBITE TESTING INC
ELECTRICAL SURVEYS PIONEER ENERGY SER.
DIL-MEL
CNL-CDL
BHCS

FORMATION TOPS & STRUCTURAL POSITION

FORMATION	SAMPLE TOP	ELECTRIC LOG TOP	SUB-SEA DATUM	STRUCTURAL POSITION
ANHYDRITE - TOP	3152	3157	+98	-13
ANHYDRITE - BASE	3188	3190	+65	-6
NEVA	3649	3653	-398	-10
RED EAGLE	3712	3715	-460	-9
FORAKER	3759	3764	-509	-9
TOPEKA	3977	3976	-721	-7
DEER CREEK	3994	3994	-739	-8
OREAD	4095	4094	-839	-9
LANSING	4199	4200	-945	-10
STARK	4415	4410	-1155	-9
BKC	4463	4460	-1205	-9
PAWNEE	4583	4580	-1325	-8
CHEROKEE	4668	4666	-1411	-12
TOTAL DEPTH	4780	4781	-1526	

REFERENCE WELL FOR STRUCTURE MURFIN DRLG CO. DOWNING 'A' #1-19
330' FNL, 2060' FWL, SEC 19-T1S-R35W, RAWLINS CTY

DRILL STEM TESTS

No.	Interval	IFP/Time	ISIP/Time	FFP/Time	FSIP/Time	IHH-FHH	RECOVERY
1	4142-4270 LANS 'A'-'D'	82#-482# 30"	1069# 60"	492#-663# 60"	997# 90"	2199#-2039# 120°F	94' GIP 198' DCWM 1316' MCW (32%M, 68%W)
2	4273-4385 LANS 'G'-'I'	21#-37# 30"	1228# 60"	41#-53# 30"	1173# 60"	2597#-2248# 124°F	20' MUD, NS
3	4368-4420 LANS 'J'	23#-72# 30"	990# 60"	83#-139# 60"	991# 90"	2254#-2125# 125°F	134' GIP 14' CO 50' MCO 188' OCM

BIT RECORD

NO	SIZE	MAKE	TYPE	DEPTH OUT	FEET	HOURS
1	12¼		CHKJ	267	267	2½
2	7⅞		DP506	3611	3344	42¼
3	7⅞		GX20C	4780	1169	59½

PIPE STRAPS & DEV. SURVEYS

DAILY PENETRATION

DATE	DEPTH
2-14-14	MIRT
2-15-14	267'-WOC
2-16-14	2300'-DRLG
2-17-14	3450'-DRLG
2-18-14	3925'-DRLG
2-19-14	4270'-CFS
2-20-14	4330'-CFS
2-21-14	4400-CFS
2-22-14	4540-DRLG

MUD RECORD

MUD TYPE: PUMP SIZE: BPS:

NO	DATE	DEPTH	ACTIVITY	WT	VIS	WL	YP	PH	GS	LCM	CHL
3	2-17	3611	BIT TRIP	9.0	35	8.8	5	9.5	8/16	4.0#	500
4	2-18	3993	DRLG	9.2	58	10.0	14	10.0	28/42	4.0#	700
5	2-19	4270	CFS	9.0	80	6.4	31	10.5	35/52	4.0#	700
6	2-20	4367	DRLG	9.5	53	7.6	14	10.0	18/30	4.0#	1100
7	2-21	4420	DST #3	9.1	65	6.4	22	11.5	19/37	3.0#	1000
8	2-22	4606	DRLG	9.2	73	7.2	28	10.5	24/42	2.0#	800

LOG 7710

LEGEND

▨	▨	▨	▨	▨	▨	▨	▨	▨
Anhydrite	Salt	Sandstone	Shale	Carb sh	Limestone	Ool.Lime	Chert	Dolomite

DRILLING TIME IN MINUTES PER FOOT

Rate of Penetration Decreases

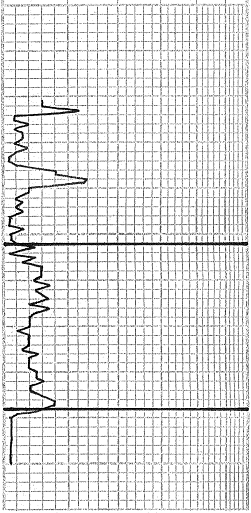
DEPTH

LITHOLOGY

SAMPLE DESCRIPTIONS

OIL SHOWS

REMARKS



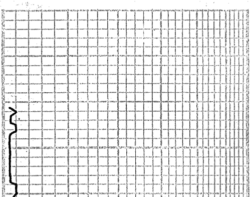
3100

3150

ANHYDRITE-TOP
3152 (+103)

ANHYDRITE - BASE
3188 (+67)

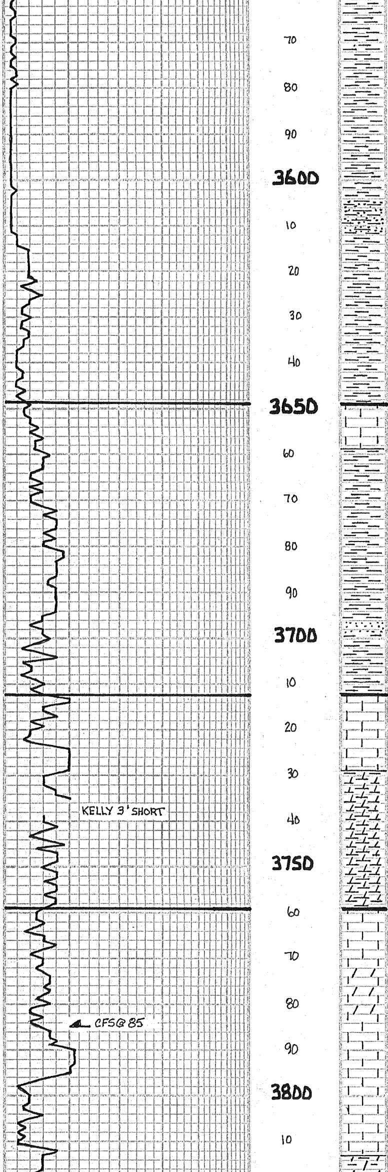
3200



3550

sh: rust, v. silty; ss: wh, lt. grey, v. fn grained, sli. calc, no vis ø, NS

60



sh: rust, rust-brown, silty, few scat ls inclusions; imbedded anhy nodules

sh: rust, silty → red siltstone, wh, lt. grey siltstone → v.fn grnd ss, no vis ø, NS

sh & siltstone as above; scat ls inclusions

sh: rust, silty w/ wh, lt. grey, siltstone → v.fn. grained ss, chalky calc in part, no vis ø, N.S.

as above w/ sh: grey, some ls laminations & inclusions; ss: v.fn. grnd, grey, well-sorted, scat pr.-tr fr intergrnd ø, N.S.

sh & ss: as above, N.S. w/consider-able pyrite

sh: rust, brown, sli. silty w/ sh: grey, green, silty, calc

sh: rust, brown w/ ss: clear, fn-grained, subrnd, well-sorted, tr glauc, app pr-some fr intergrained ø; no st, cut or odor, NSO

NEVA
3649 (-394)

ls: tan, lt. grey, fn-med xtln, sli. foss, calcitic, granular in part, scat. pr. ppt & interxtln ø, no st, cut or odor, NSO

sh: rust, brown, silty

sh: rust, brown, silty, some gry, grn

sh: rust, brown, silty; few clusters lt. grey siltstone; no vis ø, NS.

sh & siltstone: as above w/ few cluster ss; clear, grey, fn-grnd, sub-∠'lar, calc in pt, sli. glauc, scat. pr. intergrained ø, no st, cut, or odor, NSO

ss/siltstone; v.fn-grained, soft, calc, chalky, no vis ø; no show

sh: brown, some rust; silty in pt.

RED EAGLE
3712 (-457)

ls: wh, tan, lt. grey, fn-med, sli. foss, scat calcite, sli. sandy (v.fn. grnd) w/ Δ & included Δ, bright orange, op. fresh; scat pr interxtln & ppt vuggy ø, no st, cut or odor, NSO

ls: med brown, med grey, v.fn-some med xtln, dense; no vis ø, NS

sh: brown, rust, silty; few pcs dolo: wh, beige, vfnxtln, no vis ø N.S.

sh: brown, dolomitic → v.fn grained silty sh; dolomite; red (shaley) v.fn xtln, no vis ø; few pcs tan, lt. grey vfnxtln dolomite; no vis ø, NS

sh, dolomitic shale; as above

FORAKER
3759 (-504)

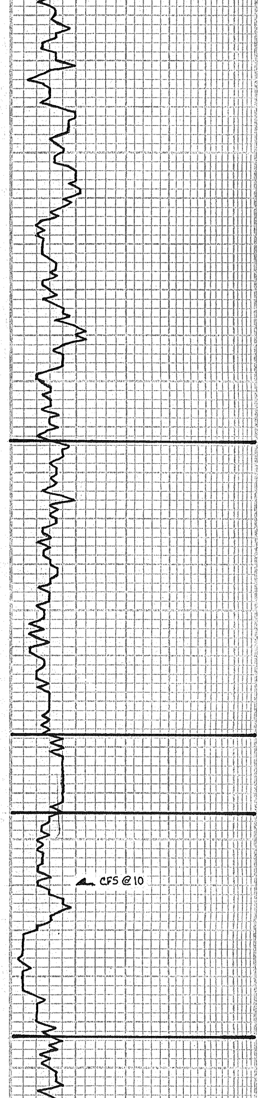
ls: wh, lt. grey, fn-med xtln, sli. calcitic, chalky in part, scat pr. ppt ø, fr amount dd oil residue; VSS scat immobile dk hvy oil/tar; v. pr scat dk st, no show live oil, no odor

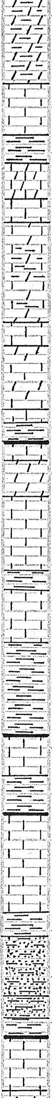
dd oil-tar show

ls: tan, brown, fn-med xtln, sli. dolomitic; no vis ø; dolo: grey, vfn xtln, shaley (grey) in pt, no vis ø, NS. ls: wh, tan, fnxtln, chalky in part, trace dd oil residue in pr. ppt ø, no show live oil.

ls: tan, brown, grey, mostly fnxtln, dolomitic in part; no vis ø, NS. ls: off-wh, tan, medxtln, granular, no vis ø, N.S.

dolo, dolomitic ls: tan, brown, grey scat ls inclusions, fnxtln, scat pr interxtln ø, few pcs ls, tan, med xtln, granular, apparent pr inter-grain ø; v. scat pr dd oil residue, no show live oil.





20

dolo, dolomitic ls: brown, tan, grey, v. fnxtln, no vis ø, N.S. w/ sh: grey, some w/ laminated ls inclusions

30

ls: tan, fn-medxtln, sli foss, sli sandy in part, v. sli ool., calcitic w/ poss. pr interxtln ø, no st, odor, cut

40

sh: grey, some brown

3850

dolo: dk. brown, v. fnxtln, no vis ø, no show; dolo: grey, v. fnxtln, shaley (grey); ls: tan, fn-medxtln, sli calcitic; poss scat pr interxtln ø; N.S.

60

ls: off-wh, tan, fn-medxtln, v. sli. foss, no vis ø; no show; ls: grey, fnxtln, dolomitic w/ scat ls inclusions; no vis ø; sh: grey, dolo. in part.

70

80

ls: tan, lt. brown, fn-medxtln, gran, poss pr intergrain ø; no show; few pcs grey, v. fnxtln, dense dolo; sli. shaley (grey)

90

ls: tan, lt. brown, fn-medxtln, sli. sandy, calcitic, no vis ø, N.S; dolo: grey, v. fnxtln, sli shaley; tan, fnxtln no vis ø, no show

3900

dolo & ls: as above w/ inc in grey shaley dolomite

10

STOTLER

3913 (-658)

ls: tan, lt. brown, fn-medxtln, foss in part, some ool, w/ calcite cement, no vis ø, NS

20

ls: as above: inc in lt. brown, oolitic ls, dense w/ dolo: grey, lt. brown, v. fnxtln, dense

30

ls: tan, lt. brown, fn-medxtln, sli foss & ool, no vis ø; no show; sh: grey w/ included ls fragments

40

ls: as above; dense; w/ sh: grey, grey-green, sli. sandy

3950

ls: off. wh, tan, fn-medxtln, sli foss, ool. in part, poss pr interxtln ø, w/ red shale st., no show

60

sh: grey, rust; dolo: vfnxtln, grey, brown, shaley in part; no vis ø, no show

70

sh: rust, some grey, grey-green; w/ ls: tan, fn-medxtln, ool in pt, app pr interxtln ø, most w/ red shale infilled, no show

TOPEKA

3977 (-722)

80

sh: mostly rust, some grey-grn

90

DEER CREEK

3994 (-739)

ls: off-wh, lt. grey, fn-xtln, chalky in part, v. scat pr ppt ø, trace dd oil residue, no show live oil.

dd oil show

4000

ls: off-wh, tan, lt. grey, fn-medxtln, v. sli. foss, chalky in part, no show

10

ls: as above, some green tint (sh), w/ sh: brown, rust, some grey

20

mostly sh; rust, brown, silty → sandy; few clusters ss: grey, fn-grained, sub-rnd, well-sorted, firm, sli glauc, app pr intergrained por, no st, cut or odor, no show live oil

30

sh: rust, brown, some silty + sdy few pcs sh: grey, sli. sandy

40

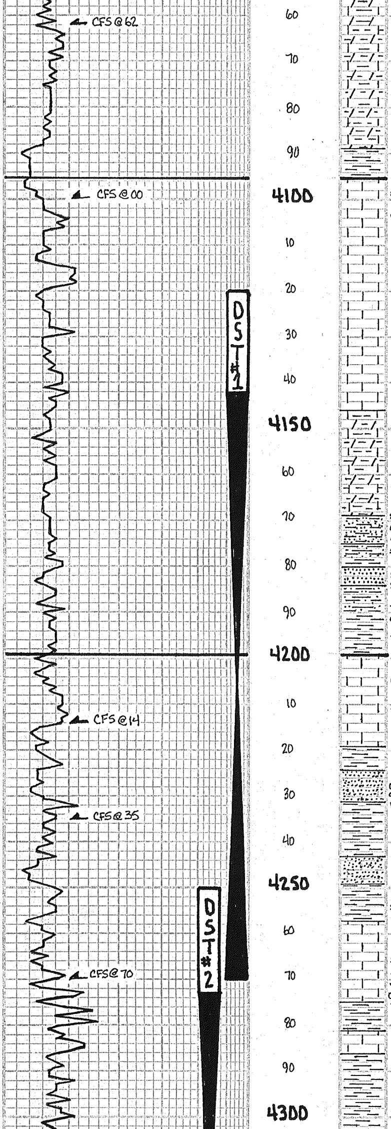
LECOMPTON

4043 (-788)

ls: off-wh, lt. grey, fn-medxtln, sli foss, chalky in part, scat v. pr isolated vuggy ø, scat dd oil residue & few pcs w/ spots inert hvy dk oil/tar; no sho live oil.

dd oil-tar show

4050



dolo: purplish-brown (shaley), vfn xtln, no vis ø, no show; → dolo sh

dolo & dolomitic sh; as above w/ sh: rust, brown

purple-brown dolo & dolomitic sh w/ grey sh, dolomitic

as above w/ sh: grey, calc; rust, brown

sh: grey, rust, brown

OREAD
4095 (-840)

ls: wh, tan, fn-med xtln, sli ool, sli foss, chalky in part, scat pr interxtln ø, some infilled w/ calcite vpr-pr ppt. ø, few pcs w/ pr dd oil, spots inert dk hvy oil/tar; no show live oil.

dd oil/tar show

ls: wh, tan, lt. grey, fn-med xtln, sli. ool & chalky; scat pr ppt & vuggy ø, barren; no show

ls: as above; w/ scat pr ppt & vuggy ø; no show; few pcs lt. grey, fnxtln, dolomitic ls, sli. chalky. no vis ø NS

ls: wh, tan, lt. grey, micro-fnxtln sli. chalky, no vis ø; no show

ls: as above w/ ls: brown, dk. grey, microxtln, dense; sh: grey, few pcs Δ brown, fresh, opaque

ls: brown, dk grey, micro-fnxtln, no vis ø, no show; sh: grey; few pcs dk grey, vfnxtln, dense dolo

ls: tan, off wh fnxtln, dense; ls: dk brown, dk grey, vfnxtln, dolomitic w/ grey shale, calc, dolomitic

ls: tan → brown lt-dk grey, micro fnxtln, dense; few pcs medxtln, mottled, sli. foss, dense; few clusters ss: clear, grey, fn-grained, calc, firm-fri, app scat pr intergrained ø, scat show dedd oil residue, no show live oil.

dd oil show

sh: grey, dolomitic, few ls frags included

ss: grey, fn-grained, sub-rnd, well-sorted, calc, shaley in part; app pr intergrained ø, scat dd oil residue, ftwk cut, no st, odor, no show live oil w/ inc in sh: rust, brown

sh: brown, rust, grey

LANSING
4199 (-944)

ls: wh, tan, fn-medxtln, ool in part w/ calcite cement, no vis ø, no show, ls: cpl pcs tan, lt. grey, medxtln, granular, pr intergranular ø, ss hvy dk black oil/tar, cpl minute ppts FO on brk, spotty blk stain, patchy sat. ls: brown, grey-brown, microxtln dense; no show @ CFS @ 14

PSO

sh: grey-green, grey

ss: few clusters grey, clear, fngrnd, well-sorted, sub rnd, firm-friable, app pr intergrained por, tr dd oil residue, no st, cut or odor, NSO

dd oil show

sh: rust, brown, grey; sli. silty

sh: rust, brown, sli. silty; sh: grey, silty → sli. sandy to ss: vfn grained, calc in part, shaley

sh: rust, brown, gummy; grey, grn-grey.

ls: wh, lt, grey, fn-medxtln, sli ool, sli foss, pr-scat fr interxtln & vuggy ø, gd even med brown st w/ sat, G-few pcs VGSO w/ few gas bubbles on brk, fr-gd slow streaming cut, no odor

GSO

sh: brown, some rust, grey

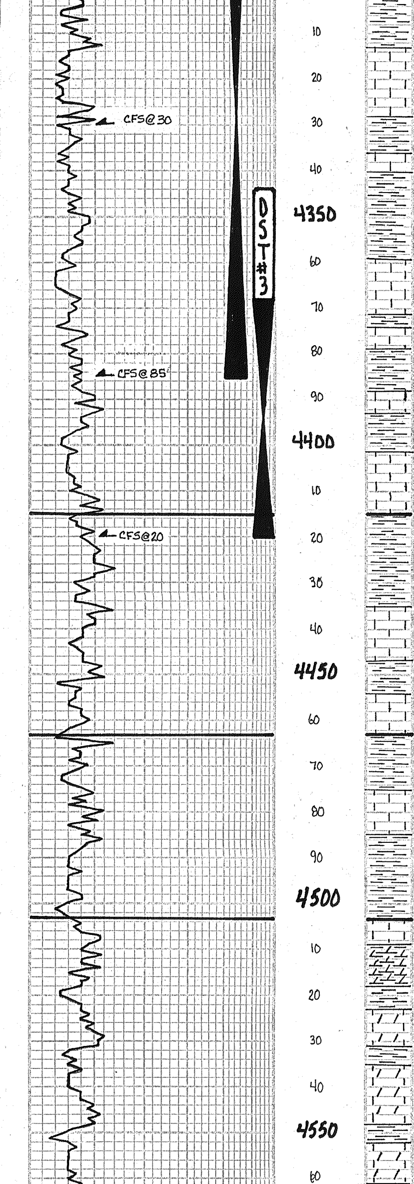
ls: tan, lt. brown, fn-medxtln, dnse w/ wh, fnxtln, chalky

sh: rust; pale green, v. finely, silty, few pcs grey w/ laminated ls. pcs (small)

DST #1
(4142-4270)
30"-60"-60"-90"
IFB: BOB IN 4"
ISIP: BLOW BUILT TO 1/4" & DIED
FFP: BOB IN 7"
FSIP: NO BLOW
RECOVERY:
94' GIP
198' OCMW
(15% O, 20% M, 65% W)
1316' MW
(32% M, 68% W)
CHL: 40,000 PPM MUD: 700 PPM
HSP: 2199#-2039#
FP: 82#-482#/492#-663#
SIP: 1069#-997#
BHT: 120° F

*DST #2: HIT BRIDGE 180' OFF BOTTOM. SLID TOOL 15'

DST #2



sh: rust, rust-brown, grey

ls: off.wh, tan, fn-medxtln, sli.ool, foss (fusil), chalky in part, scat pr-some fr. interxtln & vuggy ø, spotty med-dk brown st w/ p-tr FSO on break, no odor — PSO

ls: as above; significant dec in show w/ ls: lt. grey, fnxtln, no vis ø;

sh: pale grey, calc, hard

sh: brown, rust; sh: grey, calc

ls: off.wh, tan, fn-medxtln, scat vpr interxtln por, pr spotty st, NSFO, no odor

sh: pale grey & pale grey siltstone

sh: grey, pale grey; some rust

ls: tan, lt. brwn, fn-medxtln, foss, sli ool, chalky in part, pr. some scat fr interxtln ø, pr-few pcs fr st w/ patchy sat, s-few pcs FSO on brk, slow-med streaming cut, no odor — PSO

sh: grey

ls: lt. grey, lt. brown, fn-medxtln, v sli foss, chalky, no vis ø; NS

sh: rust, brown, some grey, green

ls: tan, grey, wh, fnxtln, dense

sh: brown, rust, grey, grn-grey

ls: off.wh, tan, fn-medxtln, sli. foss, app pr-fr ppt ø & fr vuggy ø; scat pcs recemented ls frags w/ fr inter particle ø, fr-few pcs w/gd med-dk st, scat st along small frac's, s-FSO (gassey) on break, cpl pcs w/ natural bleed, no odor — FSO

sh: brown, rust, grey; greenish-grey silty sh

sh: rust, silty; sh: grey, brown

sh: rust, silty; sh: brown w/ purple tint, grey

ls: tan, lt. grey, fn-medxtln, foss, ool in part, scat v. pr. interxtln ø, no st, cut, odor; no show live oil.

sh: rust, brown, grey

ls: off.wh, tan, fn-med xtln, foss, oolitic, no vis ø; no st, cut, odor

ls: as above; few pcs lt. grey. fn-med xtln w/ interbedded green, red sh. no vis ø, no show

sh: grey, brown; few pcs rust, green

ls: tan, lt. grey. fn-med xtln, sli. foss, no vis ø; no show; ls: wh, fnxtln sli. sandy; considerable ss/siltstone wh, lt. grey, v. fn grained, v. calc, no vis ø, no show

sh: brown, grey, rust; green, scat interbedded ls fragments.

ls: off.wh, tan, fn-medxtln, v. sli foss, sandy in pt (v. fn. grnd), calc no vis ø, no show

sh: green, interbedded ls fragments

sh: brown, calc; sh: grey, dk grey, dolomitic → vfnxtln, shaley, dolomite

sh: brown; sh: grey, green; calc in part; ls: med grey, v. fnxtln, dolomitic, shaley in part; no vis ø, no show

sh: mostly brown, silty; some rust; grey, green, sli. calc, few scat ls inclusions

sh: brown, rust, some silty; sh: orange, grey, green; few pcs tan, fn-medxtln ls w/ interbedded rust, brown, shale

ls: greyish-tan fn-medxtln, sli foss, scat streaks & brown shale infill; ls: grey-tan, microxtln, dense

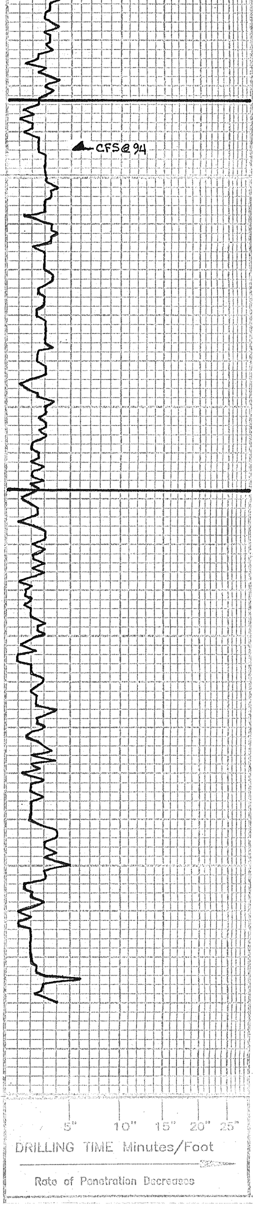
4273 - 4385
30"-60"-30"-60"
IFP: 1/4" BLOW DIED IN 22"
FFP: NO BLOW
RECOVERY:
20' MUD N.S.
HSP: 2597# - 2248#
FP: 21# - 37# / 41# - 53#
SIP: 1228# - 1173#
BHT: 124 °F
* IFP: 2 PTS VERY MINOR PLUGGING

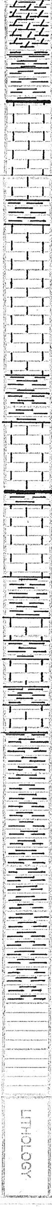
DST#3
4368 - 4420
30"-60"-60"-90"
IFP: SURF BLOW BLDG TO 2"
ISIP: NO BLOW
FFP: SURF BLOW BLDG TO 2"
FSIP: NO BLOW
RECOVERY:
134' GIP
14' CO
50' MCO (30% M, 70% O)
188' OCM (30% O, 70% M)
HSP: 2254# - 2125#
FP: 23# - 72# / 83# - 139#
SIP: 990# - 991#
BHT: 125 F

STARK
4415 (-1160)

BKC
4463 (-1208)

MARMATON
4503 (-1248)





DEPTH	SAMPLE DESCRIPTIONS	OIL SHOWS	REMARKS
	sh: mostly grey, some rust, brown; w/ shale; med grey, dolomitic		
70			
	sh: few pcs dk grey/blk; w/ shale grey, calc/dolomitic		
80	sh: as above		PAWNEE 4583 (-1328)
90	ls: tan, fn-med xtln, sli calcitic, sli. foss; oolitic in part, fr-interxtln & vuggy ø, cpl pcs gd interoolitic ø; no st, no cut, no odor; NSO: ls: wh, fnxtln chalky		
4600	ls: grey, dk. grey, vfn-fn xtln, no vis ø, NS		
	sh: grey, brown		
10	ls: grey, few pcs tan, fn-medxtln, no vis ø, NS; scat wh. fnxtln, chalky ls A brown-grey, fresh, op-semi trans		
20			
	ls: grey, brownish-grey, vfn-some medxtln, no vis ø, NS		
30			
	ls: as above; grey ls becoming shaley		
40			
	sh: black, v. dk. grey		
4650			
	sh: grey, calc, ls inclusions; brown, lt. grey, some green		
60	ls: off-wh, lt tan-grey, fn-medxtln, sli foss, v sli ool, no vis ø, NS		
	ls: as above w/ ls: wh, fnxtln, chlky		CHEROKEE 4668 (-1413)
70	sh: mostly brown, grey		
	ls: tan, lt. brown, fn-medxtln, v sli foss, tr ool, no vis ø, NS		
80	ls: as above w/ ls: tan, grey, micro-fnxtln, dense		
90			
	sh: grey, brown, some rust		
4700	ls: mostly grey, some brown, fn-medxtln, shaley in part (green) no vis ø, no show		
10	ls: & sh: as above		
	ls: tan, grey, fn-medxtln, no vis ø; no show; ls: greenish-grey fnxtln, shaley w/ sh: brown, grey		
20			
30	sh: mostly brown, some grey, green few clusters clear med grained ss; sub round, fair sorting, shaley, calc, hard, no vis ø, no show		
40	sh: brown w/ some imbedded med grained sd; ls: off wh, fnxtln, sdy sli glauc, dense; few clusters grey, fn grained ss, calc, shaley, hard, no vis ø no show		
4750	ls: tan, fn-medxtln, sli foss, v sli. sdy no vis ø, no show		
60	sh: brown, rust-brown, some interbedded w/ grey, green sh, some included ls frags scat rust brown siltstone		
70	sh: mostly brown, silty to sli sdy in part; some grey, green • few clusters grey, fn grained, shaley, sli calc ss: no vis ø; no show		
	sh: brown, silty/sdy; ss: brown, fngrnd well sorted, brown sh matrix, no vis ø; ss: tan, fn grnd, well sorted, firm, poss pr intergrained ø; no st, cut, odor; NSO		
80	ss: clear, med-crse grained, sub rnd-∠'lar, pr-fr sorting, stained rust w/ some rust shale matrix, scat pr intergrained ø, no st, odor, cut; NSO		RTD 4780 (-1525)