PHIL ASKEY

PETROLEUM GEOLOGIST

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

COMPANY Mull Drilling Company, Inc.

LEASE Hempler # 1-18

FIELD Wildcat

LOCATION 699' FSL & 2104' FWL

SEC 18 TWSP 18 S RGE 27W

COUNTY Lane STATE Kansas

CONTRACTOR Duke Drilling Rig #4

SPUD 4-30-13 COMP 5-8-13

RTD 4675' LTD 4676'

MUD UP 3461' TYPE MUD Chemical-Mud Co

ELEVATIONS

KB 2719'

GL 2710'

Measurements Are From KB

API # 15-101-22436-0000

CASING

SURFACE 8 5/8" @ 219' w/ 165 sxs

PRODUCTION —

ELECTRICAL SURVEYS

Nabors: COL/CNC; OIL; micro; Sonic

SAMPLES EXAMINED FROM 3700' TO RTD

DRILLING TIME KEPT FROM 3700' TO RTD

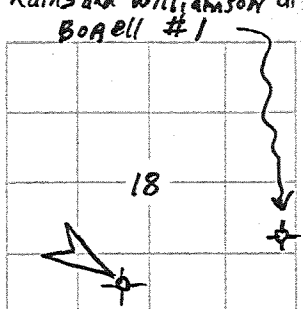
GEOLOGICAL SUPERVISION FROM 3750' TO RTD/LTD

GEOLOGIST ON WELL Phil Askey, L.G.

FORMATION TOPS	LOG		SAMPLES	+/-
Anhydrite	2090	+629	2092	+5
Heebner	3953	-1234	3953	+2
Lansing	3993	-1274	3992	+1
Stark Shale	4270	-1551	4269	+3
B/KC	4348	-1629	4348	+1
Marmaton	4380	-1661	4379	-5
Pawnee	4460	-1741	4460	+3
Ft Scott	4520	-1801	4520	+4
Cherokee Sh	4544	-1825	4544	+5
Johnson Zn	4583	-1864	4583	+6
Mississippi	4616	-1897	4615	+4
LTD/RTD	4676	-1957	4675	4' deeper

REFERENCE WELL

Rains and Williamson Oil Co. Bogell #1



REMARKS

The Mull Drilling Co, Hempler #1-18, ran structurally high (except Marmaton) to one of the reference wells, Rains and Williamson Oil Co., Bogell #1. The two sands showed were observed were DST'd with non-commercial oil/gas returns.

After review of all E-logs, it was determined that the Lansing 'K' Zone did not develop sufficient thickness and porosity. Therefore, it was decided to plug and abandon this well.

Phil Askey, L.G.

LEGEND

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

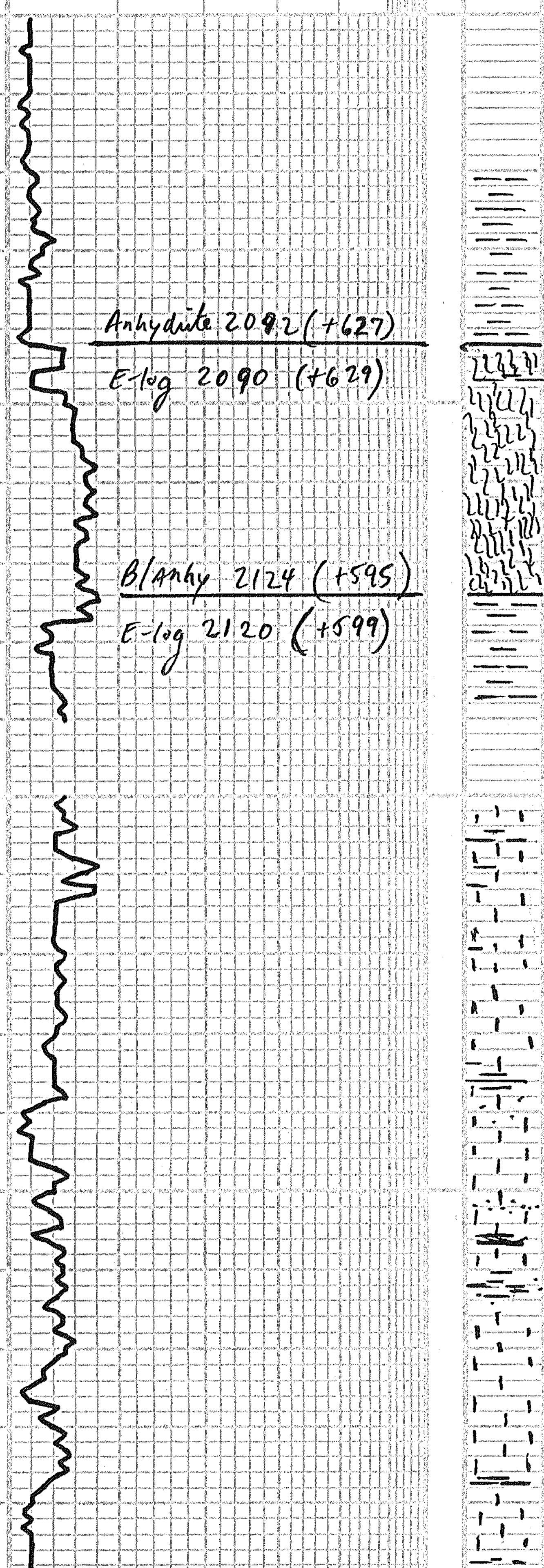
SCALE 1" = 100'

DRILLING TIME IN MINUTES

DEPTH	PER FOOT Rate of Penetration Increases 5" 10" 15" 20" 25"	LITHOLOGY	SAMPLE DESCRIPTIONS	REMARKS

2050

2100



3700

LS, tan gy offwh, brn, dns, micro-fxln, tr foss, sme shcky scat xln Ø, NS

sme m-dkgy LS, dns, arg dk-foss

LS, tan, frm, fxln-vfxln, foss xln Ø, NS

sme gy-dkgy, frm-dns, crpto-microxln, foss, tr shcky, NS

SH, gy, tr slty

LS, tan gy offwh, frm, fxln, sme ph-ppt-vug gy xln Ø, NS scat offwh, shcky-chky

50

SH, dkgy, blk, gy sme calc tr slty

LS, gy-gy brn mott-brn, dns, micro fxln, sme arg, tr foss, dk foss, tr shcky, n vis Ø, NS

LS, tan frm, fxln w/ xln Ø, NS

LS, gy-gy brn, dns, micro-fxln foss, p Ø, NS

LS, crm-tan, gy, frm, vf-fxln

Samples: 10' wet & dry 3700'-RTD good samples

Mud-Co data @ 3732'

WT 8.6 VIS 48 WL 7.6 Solids 2%

pH 10.5 Cl 3,400 ppm LCM 1# YP 12

Rig data:

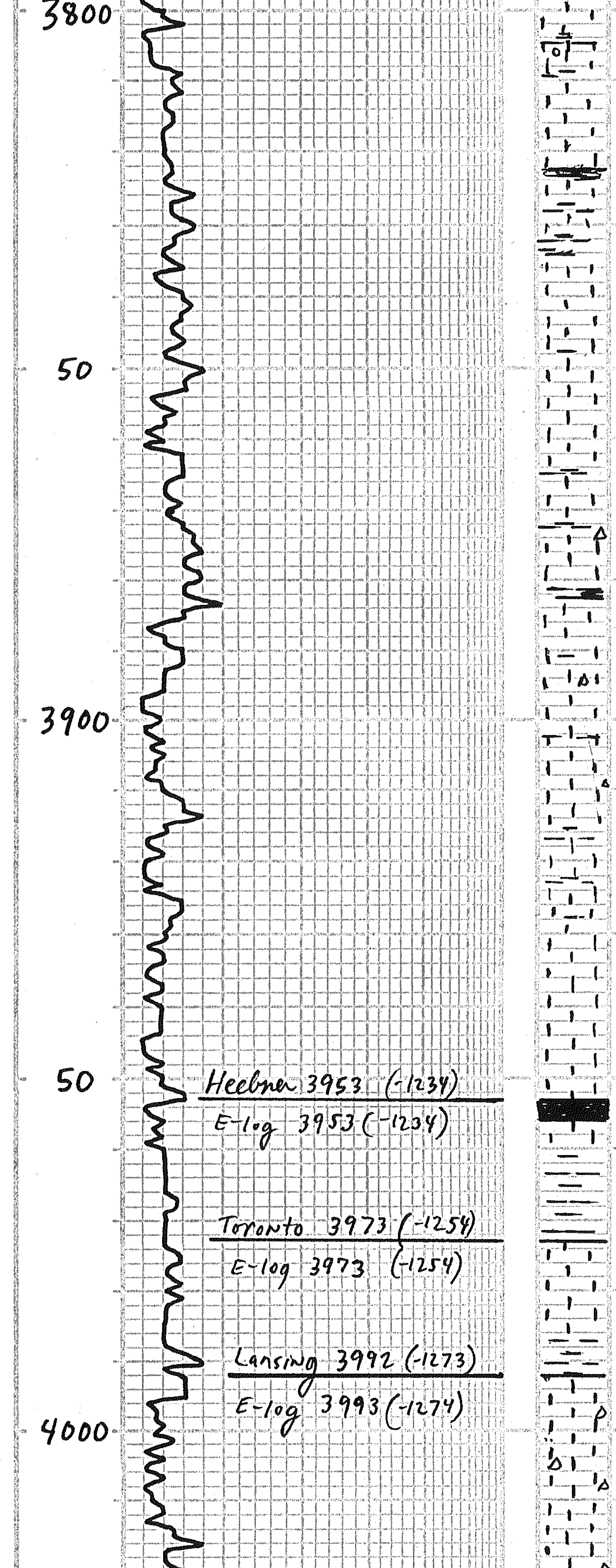
WOB 38K PP 950#

SPM 60 RPM 80

Bit data:

7 7/8" Varel (45 ft/hr)

219'-4675' 98 3/4 hrs



tr xln ø, NS sme wh-chky

Sh, dkgy-blk, sbcarb

LS, brn-tan gybrn, dns, blky crptx-microxln, tr arg, tr foss
NVIS ø, NS

Sh, blk, carb dkgy-gy

LS, tan crm offwh, frm, micro-vf fxln, sme shchky
tr foss, scat xln ø, NS
2pc qtz grains

LS, tan offwh ltgy, frm, fxln w/ fr intxln ø, NS
sme wh chky

LS, tan gy gybrn, frm-dns, crptx microxln, sme fxln
p ilw ø, NS 3pc Cht, gy-tan
blk carb Sh dkgy

LS, crm wh-offwh, frm, vf-fxln
sme foss, sme shchky-chky, fr intxln ø
tr crm tan Cht

LS, tan crm gybrn frm-dns, microxln, NS arg
scat gy-dkgy Sh rdbrn-gygrn
2 pc pyr

LS, tan offwh crm ltgy, frm-dns
vf-fxln, shchky-chky, scat fr intxln ø, NS

LS, crm tan, frm, vf-fxln, fxln ø, NS
sme chky-shchky

Sh, blk, fis, carb
LS, gy tan crm, vfxln w/ xln ø, NS

Sh, m dkgy gygrn-grn

LS, offwh tan ltgy, frm, vf-fxln,
much wh chky-shchky, scat xln ø, NS
tr brn-tan, frm, fxln w/ xln ø, NS
Sh, dkgy-gygrn sme rdbrn

LS, offwh ltgy lt tan, frm
vf-fxln, sme wh-chky, sme foss
tr ltbrn-dolomitic ?. scat xln ø, NS
scat Cht, offwh ltgy-tan fresh

LS, tan, ltgy, frm, sme chky,
scat xln ø, NS tr cht a/a

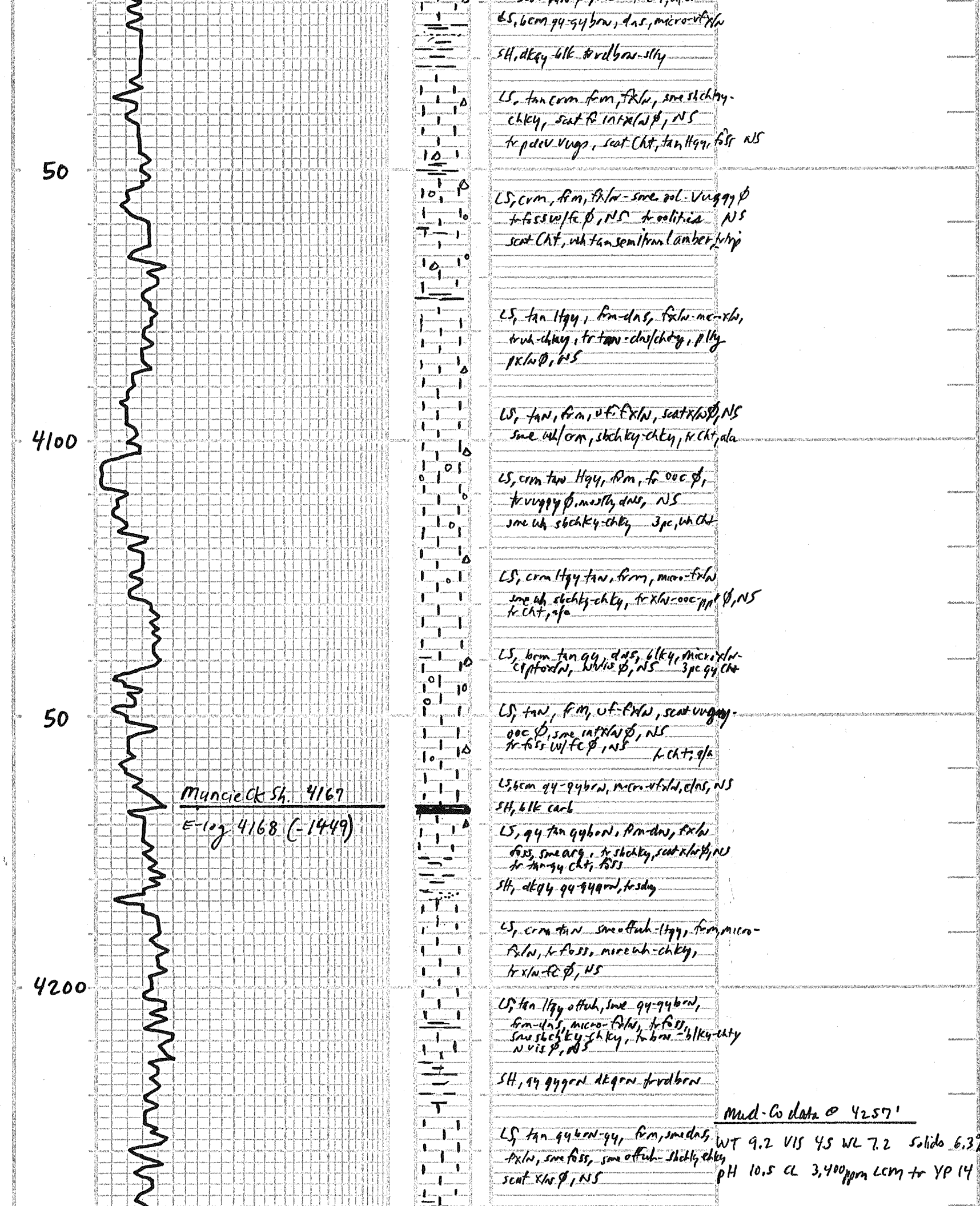
Dev Surveys

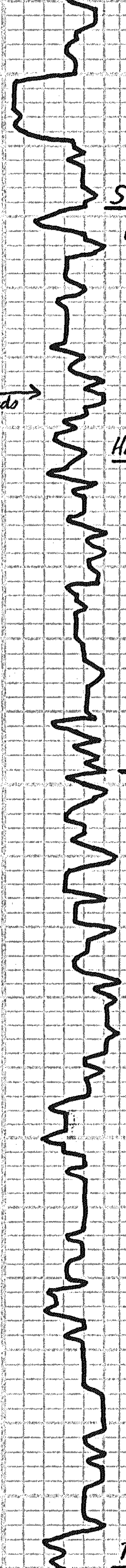
3/4° @ 219'
3/4° @ 970'
3/4° @ 1467'
1/2° @ 1963'
1/4° @ 2556'
1/2° @ 3055'
3/4° @ 4295'
3/4° @ 4675'

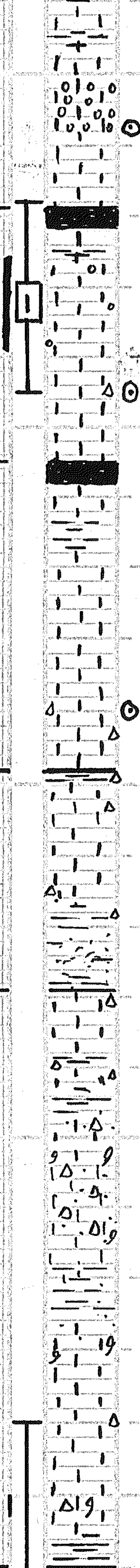
Pipe Strap @ 4295'

Board 4268.76
Strap 4267.95
pipe short .81 (no corr made)

DSTs: 2 by Diamond Testing


50
4100
50
Muncie Ck Sh. 4167
E-log 4168 (-1449)
4200
Mud-Co data @ 4257'
WT 9.2 VIS 45 WL 7.2 Solids 6.3%
pH 10.5 Cl 3,400ppm LCM tr YP 14





50

4300

Short trip 20 stands

50

4400

50

Stark Sh. 4269 (-1550)

E-log 4270 (-1551)

Hushpuckney Sh. 4305

E-log 4305 (-1586)

B/KC 4348 (-1629)

E-log 4348 (-1629)

Marmaton 4379 (-1660)

E-log 4380 (-1661)

Pawnee 4460 (-1741)

LS, gybrn tan, dns, micro-fxln, foss, NS
sme SH, gy-dkgy, sme mushy

LS, tan-crm, sme gy, frm-dns, vg ooc ϕ, NS
scat wh chky

CFS: LS, a/a, exc ooc ϕ, NS

LS, tan offwh, gy-gybrn, dns, microxln, sme foss, NVIS ϕ, NS

SH, blk fis carb

LS, crm, frm, f-mxln, sme foss,
scat fr intxln ϕ, tr p dev ool-ooc-vuggy-fc ϕ, sme lt brn stn, ltFO, flor, tr odor much wh-chky

CFS: LS, crm tan, frm, vf-fxln, sme wh-chky, scat xln-ool-ooc-fc-vuggy ϕ, hidden ltFO, tr odor 5% w/ show, tr wh Cht

LS, tan gy offwh, dns, micro-fxln, foss, sm wh-chky, pxln ϕ, NS

SH, blk fis, carb

LS, tan gy offwh, dns, crypto-microxln foss

LS, tan gy, dns, crypto-vfxln, sme wh-chky, sme foss, scat plty-blky, sme pxln ϕ, NS

CFS: LS, lt gy-gy, dns, crypto-microxln, tr vfxln, sme wh-chky, sbchky, NVIS ϕ, NS
tr crm, frm-dns, vfxln-vfxln ϕ, NS

LS, a/a, sme gybrn-brn, dns, sme arg, NVIS ϕ, NS, tr Cht, gy-blue, fresh

SH, blk dkgy

LS, gy-gybrn-brn, tan, mostly dns, micro-fxln, sme foss, sl arg, tr mott, tr xln ϕ, NS 5pc Cht, gy wh

SH, gy gygrn, tr slty 5pc Cht, gy wh, NS

sme SS, ltgy/wh, frm, vf-fgran, slty, sbrnd, mstr, f gran ϕ, NS

LS, tan ltgy, dns-chty, crypto-micro-vfxln, tr foss, sme sbchky-chky, NVIS ϕ, NS scat Cht, ltan, ltgy

much SH, dkgy-gy gygrn brn sme slty

LS, tan offwh ltgy, frm-dns, micro-fxln, tr chty impt, sm offwh sbchky-chky, sme rdbrn SH, frm-dns, microxln

scat rdbrn SH
sme LS, frm-dns, crm, coral fossil fc ϕ, NS

scat Cht, tan amber col, tr foss
scat sdy LS foss, wh/crm, f-mgran, frm, sbang-sbrnd, f-msrt, sme gran ϕ, NS

LS, wh offwh, lt tan, frm dns, micro-fxln, tr foss, tr chky,
tr crm coral fossil fc ϕ, NS
3 pc SS, clr/crm, f-mgran, intgran ϕ, NS
tr gy-gybrn, dns, chty, crptoxln

LS, tan ltgy, dns, sme chty, plty, 3 pc coral foss, crpto-microxln, NVIS ϕ, tr flor, sl odor
2 pc SS f gran, fri, vf gran ϕ NS
tr sme Cht, tan semitransl, fresh NS

DST #1 4268'-4295'

Times: 5"-30"-60"-120"

1st open: blow built to 6 inches (no blow back)

2nd open: BOB in 12" (blow back to 3½ inches)

Rec: 463' GIP

83' CO 35.4 grav corr

72' G&OCM (5% gas 40% oil 55% mud)

124' OCMW (3% oil 80% wtr 17% mud)

Total fluid 279'

cl 39,000

Rw .28 @ 45°

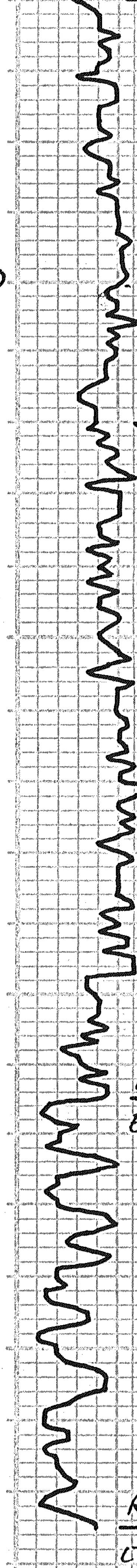
IFP 26-38# ISIP 771#

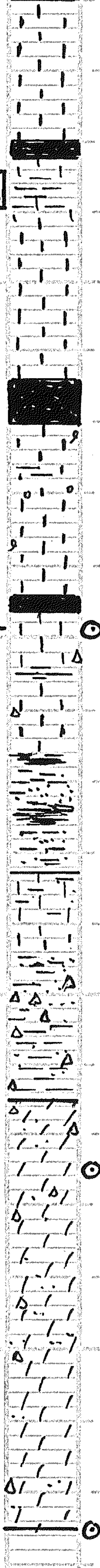
FFP 46-128# FSIP 772#

HP 2076-2068# BHT 125°F

DST #2 4440'-4549'

Times: 5"-30"-30"-60"





4500

50

4600

50

E-log 4460 (-1741)

Ft. Scott 4520 (-1801)
E-log 4520 (-1801)

Che Sh. 4544 (-1825)
E-log 4544 (-1825)

Johnson ZN 4583 (-1864)
E-log 4583 (-1864)

Miss 4615 (-1896)
E-log 4616 (-1897)

RTD 4675 (-1956)
LTD 4676 (-1957)

2

LS, tan offwh ltgy, mostly dns
cmpta-microxln, tr sbchky, tr pllty chty, tr dk foss, NVIS Ø, NS

LS, bcm gy-gybrn tan-brn, dns, micro-crptoxln, dk foss, sme plty-NVIS Ø, NS
Sh, blk carb

LS, brn dns blky
gy-tan offwh ltgy, frm, microxln-vfxln, sme foss, NVIS Ø, NS
sme offwh, sbchty

LS, tan ltbrn gy, dns, micro-vfxln, sme offwh sbchky tchky, NVIS Ø, NS

Sh, blk, carb

LS, tan offwh ltbrn-gybrn,
frm-dns, micro-fxln, sme foss
2 pc ool Ø, 3 pc crm coral fosscast Ø
3 pc chky, NS

LS, offwh-ltgy, frm, sft-sbchky, NS
much gy brn tan-brn, gy, dns, chty lmpt, microxln, tr foss,
NVIS Ø, NS 3 pc coral foss, p Ø, NS
Sh, blk carb
CFS: LS, a/a, NVIS Ø, NS

LS, tan-gy crm, frm-dns,
microxln, sme wh sbchky-chky
tr tan-crptxln, dns, NVIS Ø, NS
tr cht, tan vltgy opq, fresh, NS

LS, gybrn-brn-dkbrn, dns, chty
arg, tr foss, blky, crtop-microxln NVIS Ø NS
Sh, dkgy-blk
3 pc ss, ltgy, frm-sbfri, f-m gran, sbrnd,
tr slty-ltgy gygrn p-f srt, tr intgran Ø, NS
Sh, dkgy blk gygrn sme slty
tr ss, offwh-ltgy, dns, vf-fgran, sbrnd, msrt,
tight-vp Ø, NS

LS, offwh ltgy lttan tan-brn gy,
dns, vfxln, scat rdbrn, dns, vfxln,
scat sbchky-chky, pxln Ø, NS
3 pc ss, wh ltgy, vfgran, dns, NVIS Ø, NS

scat cht, wh ltgy, fresh, NS
Sh gyrdbrn gygrn tr slty
4 pc ss, wh/clr, frm, fgran, sbrnd, msrt
tr qtz grains tr intgran Ø, NS

DOL, tan, frm-dns, p sucr Ø, NS
tr scat ss, clr/wh, frm, fgran, sbrnd
tr intgran Ø, NS
scat wh cht, tr trip Ø, NS

DOL, tan, frm, tr vugs, sme sucr-vuggy Ø, NS
scat ss clr, frm-dns, fgran, sbrnd, msrt
tr gils, intgran Ø, NS 20% ss

DOL, crm ltgy lttan, frm sme dns,
chky, sme f sucr Ø, tr vugs, NS
tr cht, wh, tr trip Ø, NS
3 pc qtz grains

DOL, tan brn mott, gybrn, mostly dns, Miss-Spergen
tr vugs, pp sucr Ø, NS
fresh cht, trip
tr ss, ltgy/clr, frm-dns, fgran, scat Ø, NS
CFS: 85% DOL

1st open: blow built to 1 inch
2nd open: No blow
Rec: 10' SLOCM (1% oil 99% mud)
IFP 10-11# ISIP 428#
FFP 11-14# FSIP 80#
HP 2169-2189# BHT 121° F

Mud-Co data @ 4549'
WT 9.4 VIS 60 WL 6.8 Solids 7.7%
pH 11.0 Cl 2,500 ppm LCM 1# YP 23

5% qtz grains
5% ss
5% Cht

4700

DEPTH	DRILLING TIME Minutes/Foot (5" 10" 15" 20" 25") Rate of Penetration Increases	LITHOLOGY	SAMPLE DESCRIPTIONS	REMARKS

COMPANY Mull Drilling Co., Inc.

LEASE Hempler #1-18

LOCATION 699' FSL & 2104' FWL SEC 18 TWP 18S RNG 27W

COUNTY Lane STATE Kansas

ELEVATION: 2719' KB