

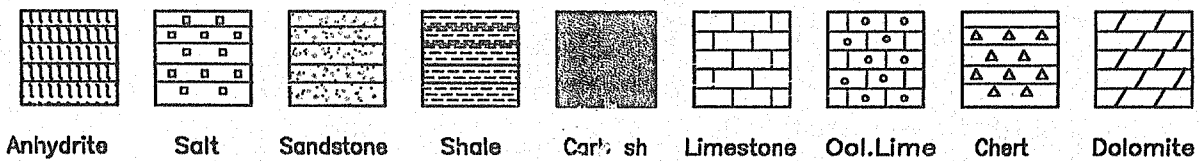
JERRY A. SMITH

CERTIFIED PETROLEUM GEOLOGIST

GEOLOGIST'S REPORT DRILLING TIME and SAMPLE LOG

COMPANY: MULL DRILLING COMPANY, INC.		ELEVATIONS	
LEASE: NEWBERRY FARMS #1-36		K.B. 1584	
FIELD: SPIVEY-GRABS-BASIL		D.F. 1582	
LOCATION: 575' FNL & 1675' FWL		G.L. 1574	
SEC. 36	TWSP. 31	RNG. 9 W	Measurements Are All From: KB
COUNTY: HARPER	STATE: KANSAS		
CONTRACTOR: PICKRELL DRLG, RIG #1		CASING	
SPUD: 10/29/14	COMP. 11/06/14	SURFACE: 8 5/8" @ 225'	
RTD. 4600	LTD. 4601	PRODUCTION : 5 1/2" @ TD	
MUD UP: 3214	TYPE MUD: CHEMICAL	ELECTRICAL SURVEYS NABORS: DIL, CNL-CDL, MEL, SON	
API No. 15-1077-22112		TO: RTD	
SAMPLES SAVED FROM: 3100		TO: RTD	
DRILLING TIME KEPT FROM: 3100		TO: RTD	
SAMPLES EXAMINED FROM: 3100		TO: RTD	
GEOLOGICAL SUPERVISION FROM: 3163		TO: RTD	
GEOLOGIST ON WELL: JERRY A. SMITH			
FORMATION TOPS		LOG	SAMPLES
HEEBNER		3415 (-1831)	3412 (-1828)
LANSING		3647 (-2063)	3647 (-2063)
KANSAS CITY		3928 (-2344)	3925 (-2341)
STARK		4080 (-2496)	4080 (-2496)
CHEROKEE		4313 (-2729)	4314 (-2730)
MISSISSIPPIAN		4384 (-2800)	4382 (-2798)

LEGEND



LITHOLOGY	DEPTH	DRILLING TIME IN MINUTES PER FOOT Rate of Penetration Increases	SAMPLE DESCRIPTIONS	REMARKS
		5" 10" 15" 20" 25"		NO GAS DETECTOR DST (1): DIAMOND MUD: MUD-CO
				S.H.T.S: 227' 3/4" 2203' 3/4"

720' 1 1/4° 2678' 3/4°
 1193' 3/4° 3151' 3/4°
 1698' 1° 4406' 1 1/4°

VERT. LOG SCALE: 5" = 100'

3100

20
40

SH - RD, Gy, GRN, w/
 SH - GRN, GRN, GRN, GRN
 No Vis. D. AND M.M.

SH - FREEDOM DK Gy
 SH - GRN, GRN, GRN, GRN
 ANY - NA.

SH, LM, ANY - AA.

SH, LM, ANY - AA.

3200

60
80
20
40
60
80

SH - GRN - M - DK Gy
 GRN, RD, BK, GRN, D.S.
 SH - ANY.

SH, LM, ANY - AA.

SH, LM, ANY - AA.

SH - FREEDOM DK Gy
 SH - GRN, GRN, GRN, GRN, D.S.
 SH.

SH - M - DK Gy, Gy -
 GRN, RD.

SH - AA.

SH - AA.

SH - AA.

LM - GRN, Gy - TA, F -
 GRN, GRN, GRN, GRN, GRN, D.S.
 GRN, D. NS.

LM - AA, NS.

LM - Gy - M Gy, Gy - TA
 GRN, GRN, GRN, GRN, GRN, D.S.
 GRN, D. NS. CHRY TA PR.

LM - AA, NS.

LM - AA, M / GRN, GRN, GRN, GRN, GRN, D.S.
 GRN, D. NS. CHRY TA PR.

SH, LM - AA.

SH, LM - AA.

BIT TRIP @ 3151'
 PIPE STRAP @ 3151':
 3153.68 STRAP
 3151.85 BOARD
 1.83 LONG

MUD @ 3155':
 9.4 WT, 32 VIS, N/C FILT,
 78,000 CHLOR, 0 LMC

3300

SH - M → DK Gy, Gy - GRN.

20

SH - A → DK Gy, Gy - GRN.

40

SH - M → DK Gy, Gy - GRN.

LM - GRN, Lt → M Gy.
FX, DSE → CHKY IN PT.

60

LM - AA.

80

LM - AA.

LM - AA.

SH - M → DK Gy.

SH - BLK, CARB.

3400

LM - ST → M Gy. FX.
DSE.

LM - M Gy. FX. DSE.

LM - AA.

SH - BLK, CARB.

20

LM - M Gy. FX. DSE.

40

SH - M → DK Gy, Gy - GRN.

60

LM - GRN, Lt → M Gy.
FX, DSE → JCAT
FR VGY B. VS.

LM - AA.

80

LM - AA.

SH - DK Gy, Gy - GRN.

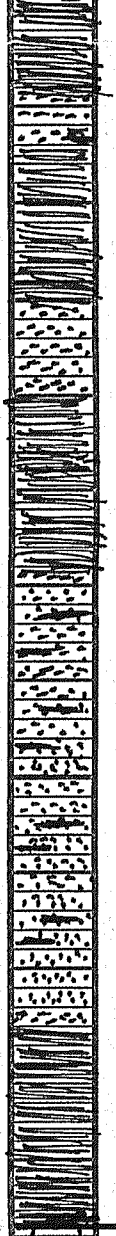
SH - AA.

3500

SH - M → DK Gy, Gy - GRN.
RED, GRN IN PT.
W/ ABD Gy, Mic Jct.
STN.

SH & Silt - AA.

HIEBNER
3412 (-1828) SMPL
3415 (-1831) LOG



20
40
60
80
3600
20
40
60
80
3700
20
40

SH of Silt-AA.
 Silt, Silt-AA w/WH, NS.
 VEG, FINE, SD, NS.
 PREDOM. of Gy, Mic Silt-
 SD of WH → of Gy
 VEG, FINE, SD, NS.
 ADD. Gy, GRN, RED SH.
 Silt of SD-AA.
 Silt of SD-AA.
 PREDOM. SD-WH of Gy
 VEG → FINE, MIC, FINE
 GRN, SD, NS, SCATT
 M Gy, Mic SH.
 SD of SCATT SH-AA.
 SD of SCATT SH-AA.
 SD-WH, F.G., Mic, NS.
 FINE, FINE → FINE, NS.
 SD-AA w/SCATT Gy, Gy-
 GRN SH.
 SD-AA w/SCATT SH-
 AA.
 SD-M Gy, F.G., Mic, FINE.
 SD-AA w/ADD DK Gy,
 Gy-GRN SH.
 LM-GRN → M Gy → Gy-
 FINE, FINE, SCATT in
 FINE, NSP.
 LM-GRN → M Gy
 Gy-GRN, FINE, SCATT →
 GR DONALD, NS.
 LM-AA, NS.
 SH-M → DK Gy.
 LM-GRN → M Gy
 FINE, DSE → SH, CHKY.
 SH-M → DK Gy, Gy-
 GRN.
 LM-M Gy, FINE, DSE.
 LM-AA.
 LM-GR → M Gy, FINE →
 MX, DSE → CHKY.
 LM-AA.

LANSING
 3647 (-2063) SMPL & LOG

3800

3900

SH - DK GY.

LM - ~~LT~~ → M GY, FX.
DSE → CHKY.

SH - DK GY.

LM - M GY → TR. FX.
DSE.

LM - AA.

LM → AA. SUI INS IN
SH.

LM - ~~LT~~ → M GY → TR. FX.
DSE → SUR-CHKY.
SHLY.

LM - AA. BECOMING V
SHLY.

PREDOM SH - M → DK GY
GY - GRN w/ SCAT
RED & REDDISH-BRN
SH. SCAT LM - AA.

SH - DK GY, GY - GRN.
DK RED. SCAT LM -
AA.

SH - DK GY, GY - GRN,
DK RED. SCAT LM -
AA.

SH - DK GY, GY - GRN,
DK RED.

SH - DK GY, GY - GRN, DK
RED.

SH - DK GY, GY - GRN, DK RED.
PYRITE IN IT.

SH - DK GY → BLK, GY - GRN,
DK RED.

SH - AA.

SH - M → DK GY → BLK,
GY - GRN, DK RED.

SH - AA.

INS. ~~LM~~ → GRN, LT →
M GY, FX. DSE.

LM - GRN, LT → M GY, FX.
PASS. GR. V. NS. & PASS
Mud P. NS. CHKY.

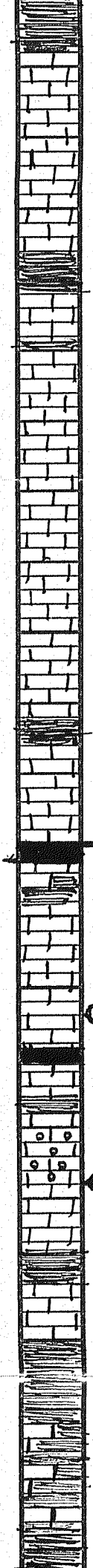
LM - AA.

LM - AA. BECOMING
LESS POROUS.

LM - ~~LT~~ → M GY.

MUD @ 3825':
9.2 WT, 48 VIS, 8.0 FILT,
6.000 CHLOR, 1# LCM

KANSAS CITY
3925 (-2341) SMPL
3928 (-2344) LOG



4000

80

20

40

60

80

4100

20

40

60

80

LM - CRM, GY - TA, FX - SPRLY
POSS. DSE. SCATT MIN
CHK. ABD DR GY SH.

ABD MGY, GY - GEN SH. w/LA -
IT - MGY, GY - TA, FX, DSE.

LM - CRM, GY - TA, FX.
SCATT VBY D. V CHRY.
NS.

LM - AA. NS.

LM - GY, TA, FX. DSE.
ABD DR GY SH.

LM - AA.

LM - AA.

LM - CRM, GY - TA, FX.
SCATT FR VBY INTX LN D.
NS. No ODR.

LM - GY, TA, FX. DSE.

LM - AA.

LM - AA.

LM - GY - TA, FX. SCATT ->
FR VBY D. NS. No ODR.

LM - GY - TA, FX. DSE ->
SUB - CHRY.

LM - AA.

SH - BLK, CARB.

LM - GY - MGY, FX. DSE.
SPRLY FOSS.

LM - CRM, GY - MGY, FX.
DSE - RARE ISOLATED
VUG. No ODR. NS.

LM - CRM, GY - FX. DSE. SUB -
CHRY.

LM - MGY, FX. DSE.

SH - BLK, CARB.
LM - GY - TA, FX. DSE.

SH - M - DR GY.

LM - MGY, FX. ODRIT w/ FR
COMUD D. No Vis SUB. VUG,
FLERTING ODR.
60" SNPL: Gd COMUD D. NS. No ODR.

LM - GY - TA, FX. ODRIT.
M FT DSE.

LM - AA.

LM - M - DR TA, FX. SPRLY
FOSS. DSE.

SH - DR GY.

LM - DR GY - TA, FX. DSE.
SHRY.

LM - AA.

STARK

4080 (-2496) SMPL & LOG

MUD @ 4173':
9.4 WT, 46 VIS, 8.8 FILT,
5,500 CHLOR, 2# LCM

4200

20

40

60

80

4300

20

40

60

80

4400

SH-DK Gy.

SH-DK Gy w/ DK Gy-TN, FX, DSE LM.

SH-DK Gy.

SH-DK Gy.

SH-DK Gy w/ SCATT DK Gy-TN, FX, DSE LM.

SH & LM-AA.

SH & LM-AA.

LM-Cr. w/ TN, FX, DSE, No Vis. D.

LM-Gy-TN, FX, DSE.

LM-AA.

SH-BLK, CARB.

LM-Lt Gy, Lt TN, FX, HO, DSE.

LM-AA.

LM-AA, CNKY IN Pt.

SH-BLK, CARB.

LM-Lt - M Gy, FX, DSE.

SH-BLK, CARB.

LM-Lt - M Gy, Gy-TN, FX, DSE - SUR - CNKY.

LM-AA, BECOMING SHLY.

SH-DK Gy, DK Gy - GRAN

SH-BLK, CARB.

LM-DK Gy-TN, FX, DSE.

SH-DK Gy.

SH-DK Gy, DK Gy - GRAN w/ SCATT LM-DK Gy-TN, FX, DSE.

SH & LM-AA.

SH & LM-AA.

SH & LM-AA w/ TN, CNT-WA, Lt Gy, Lt - M TN, DSE, SH, DSE - SUR - WEA - SED & GAS, No DOR.

CNT-WA, Lt Gy, DSE, SH, DSE, FASH, No WEA, No D. MS.

CNT-AA, No D. No DOR, MS, CNT-WA, Lt Gy, Lt TN, DSE, DRY, WEA, SED, No DOR, No Lt

CHEROKEE
4314 (-2730) SMPL
4313 (-2729) LOG

MISSISSIPPIAN
4382 (-2798) SMPL
4384 (-2800) LOG

D
S
T

①

#1

20
40
60
80
20
40
60
80

4500

@4600

CNT - WA, LF BY OPO, DEWIT PART
→ HAY WEA, FEB ODOR. GO
BRN STN. GO SHO GAS #100.

DEC IN CNT-AA. MOSTAY
CNT - WA, OPO, VIT. SHP.
DSE W/ SPTN BRN STN.
WA → FR ODOR.

CNT - AA. WA → FR ODOR.
SCAT BRN STN.

CNT - AA. WA → FR ODOR.
SCAT BRN STN.

CNT - AA. WA → FR ODOR.
NS.

CNT - AA. WA → FR ODOR.
NS.

CNT - WA, OPO, VIT. SHP.
DSE. W/ SCAT CNT.
AA. WA ODOR. NS.

CNT - AA. NS.

CNT - WA, OPO, VIT. SHP.
DSE. No VIS. No.
V WA ODOR NS.

CNT - AA. NS.

CNT - WA, OPO, VIT. SHP. DSE.
No VIS. No. No VIS. No. No
ODOR.

CNT - AA.

CNT - WA, LF → M BY OPO.
SHP DSE.

CNT - AA.

CNT - AA.

CNT - AA.

CNT - WA, OPO, SHP DSE.
W/ SCAT WA CNT.

CNT W/ HAY AA. SCAT
LM - GR - TAY, FY, DSE, HD.

CNT & LM - AA.

MUD @ 4404':
9.4 WT, 45 VIS, 9.2 FILT,
5,000 CHLOR, 2 # LCM

DST #1: 4392-4406
5-30-45-90

IF: BOB 1 MIN.
ISI: NO RETURN
FF: BOB IMMED.
FSI: NO RETURN

RECOVERY:
3500' GIP
80' G & OCWM
(25% G, 10% O, 5% W, 60% M)

CHLORIDES 8000 PPM

SIP'S: 587-586 #
FP'S: 18-26/33-46 #
HP'S: 2183-2144 #
BHT: 126° F

TOTAL DEPTH
4600 (-3016) ROTARY
4601 (-3017) LOG

LITHOLOGY	DEPTH	<p style="text-align: center;">5" 10" 15" 20" 25" DRILLING TIME MINUTES/FOOT Rate of Penetration Increases</p>	SAMPLE DESCRIPTIONS	REMARKS

COMPANY: MULL DRILLING COMPANY, INC.		ELEVATION: 1584 KB	
LEASE: NEWBERRY FARMS #1-36			
LOCATION: 575' FNL & 1675' FWL	SEC 36	TWP 31	RGE 9 W
COUNTY: HARPER	STATE: KANSAS		