

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

BRUCE OIL CO., LLC

THORNBURG #1
SEC. 7- 8S-14W
NE NW SE NE
1600 FNL & 900 FEL
OSBORNE COUNTY, KANSAS
API: 15-141-20485-00-00

DRILLING CONTR.: MURFIN RIG #8
SPUD: 07-11-2019 COMP: 07-15-2019
MUD UP: 2200' TYPE MUD: CHEM.
DRILL TIME: 2200' to RTD
RTD: 2820' LTD: 2819'
SAMPLES SAVED: 2300' to RTD
GEOLOGIST: ROBERT J. PETERSEN

ELEVATION

KB: 1785'
GL: 1780'
LOG MEASURED
FROM: KB

SURFACE CASING

8 5/8" SET @210' W/150SX

PRODUCTION CASING

5 1/2" SET @2820' W/150SX
PORT COLLAR SET @1080'

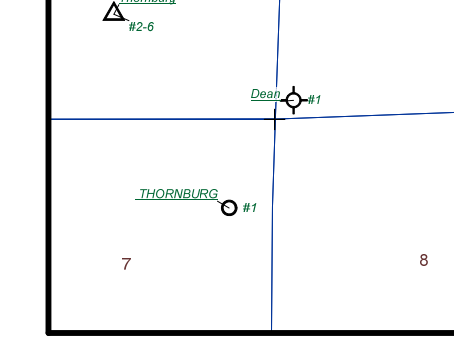
WELL LOG SURVEYS

ELI LOGGING
DUAL INDUCTION
COMPENSATED DENSITY/NEUTRON

ELECTRIC LOG TOPS

FORMATION	DEPTH	DATUM	POS A	POS B
ANHYDRITE	1070	+715	-17	-22
BASE ANHY	1103	+682	-13	-23
FORAKER	2261	-476	-28	-21
STOTLER	2533	-748	-33	-21
TARKIO LS	2584	-799	-33	-22
TOPEKA	2738	-953	-34	-19

LOCATION MAP



REFERENCE WELLS

REF WELL A:
THORNBURG #1
2310' FSL & 1000' FWL
6-8-14W

REF WELL B:
DEAN #1
SW SW SW
5-8-14W

REMARKS

PRODUCTION PIPE WAS SET TO FURTHER TEST
THIS WELL FOR COMMERCIAL PRODUCTION

DAILY REPORT @7:00 A.M.

7-11-19 MIRU
7-12-19 212' WOC
7-13-19 2297' DRILLING
7-14-19 2764' CFS
7-15-19 2820' LAYING DOWN DRILL PIPE

DRILL TIME
(min/ft)

0 5 10

2200

FORAKER

2250

2300

2350

2400

2450

2500

STOTLER

2550

TARKIO LS

2600

2650

SEVERY SH

2700

TOPEKA

2750

2800

2850

SH; Red/grat, sandy (mudding up poor sample 2300')

+tr Dolo; Gray, mottled (2310)

Dolo; Gray/white, fine crystalline, motttle in part (2320)

SH; Red/gray, sandy+ LS; Gray, dense (2340)

LS; Cream, fine crystalline, oomoldic (2350)

SH; Red/gray, sandy + LS; Cream, dense, + Dolo; Gray, dense (2360-2370)

SH; Red/gray, sandy + SS; White, fine grained, angular + LS; White, dense, tr dead stain (2380)

LS; Cream/gray, mottled, dense, (2390)

LS; Cream/gray, very fine crystalline, foss, subchalky (2400)

SH; Gray/lt gray + LS; Gray, dense (2410)

LS; Gray, fine crystalline, dolo, chalky (2420)

LS; Gray fine crystalline, foss + SH; Gray (2440)

2323' BIT TRIP
STRAP 1.23 SHORT

SH; Red/gray, sandy + LS; Tan, dense, arg + SD; Clear, fine grained, angular, friable (2450)

LS; Cream, fine crystalline, sl foss, dolo, + SH; Red/gray, sandy (2460)

LS; Cream/gray, dense, foss, chalky + SH; Gray/dark gray, sandy (2470)

SH; Gray, sandy,m mic + SD; Gray, fg, mic (2480)

LS; Tan/gray, fine crystalline to dense, foss, sl mottled, chalky (2490)

LS; Gray, fine crystalline, foss, mottled (2500)

SH; Gray, silty-sandy (2500)

LS; Gray, fine crystalline to dense, foss (2510)

SH; Gray, sandy + SD; Gray, fine to med, ang (2510)

SH; Gray, sandy + LS; Gray, dense, arg + SD; Gray, friable, mic (2520)

LS; Cream/gray, dense, arg, foss + SH; Gray, sandy + SH; Black (2530)

SH; Gray, sandy + SD; Gray, fine grained, friable w/dead oil flakes + LS; Tan,dense, foss, chalky (2540)

LS; Cream/tan, fine crystalline, foss, sl dolo, tr poor moldic por, tr dead stain (2550)

LS; Gray, fine crystalline, sl foss + SH; Gray, sandy (2560)

LS; Gray, very fine crystalline to dense, foss + SH; Gray, sandy + Tr SD; Clear, med, glauc (2570)

LS; Cream/white, fine crystalline, sl foss (2580)

LS; Cream/gray mottled, dense, foss, cherty (2590)

SH; Gray, silty-saqndy + SD; Gray/dark gray, ang, tr parrifin (2590-2600)

LS; Gray, dense, blocky (2600)

LS; Lt gray, fine crystalline, sl mottled, sl dolo, chalky + LS; Med graym dense, foss (2610)

LS; Cream/gray, very fine crystalline to dense, foss, tr edge stain, nsfo, dull fl (2620)

LS; Cream/tan/gray, dense, foss, subchalky, tr ppt moldic por, spot dead stain (2630)

SH; Gray, silty (2640)

LS; Gray/cream/tan, dense,very foss,brec in part, blocky, subchalky (2650)

LS; Tan/gray, very fine crystalline, foss, subchalkym sl glauc (2660)

SH; Gray, sandy + SD; Gray,fine grained, subang, mic, tr paraffin, nso (2670-2680)

LS; Cream/gray, very fine crystalline, foss, tr ppt por, tr dead stain (2680)

LS; Gray, dense, arg (2690)

SD; Gray, fine grained + LS; Gray, dense, foss (2700-2710)

SH; Gray/cream, sandy + SD; Gray, angular, mic + LS; Tan/gray, dense, foss(2720)

LS; Cream/tan, very fine crystalline to dense, foss (2730)

LS; Gray, dense (2740)

SD:: Gray, fine grained, ang, mic +SH; Gray (2740)

LS; Gray, dense, peletal, mottled, arg (2750)

SH; Gray/dark gray (2760)

2762' SHORT TRIP 9 STANDS

LS; Cream/gray, very fine crystalline, chalky, sl glauc, tr chert, spot stain (2760)

LS; Cream, very fine crystalline, foss, sl dolo/tr chert, poor moldic por, vssfo, faint odor, light stain on dry sample (2762/15")

SH; Gray, silty (2762/15")

LS; Tan/gray, fine crystalline, sl dol, tan/gray mott chert, tr ppt intercrystalline/ moldic por, sfo, good odor, light to med stain on dry (2772)

LS; Tan/gray, fine crystalline to dense, foss, arg in part, chert (white) lt stain, odor (2778)

LS; Tan/gray, very fine crystalline to dense, foss, chalky, cherty (black/tan mottle, tr stain (2778/15") LS; Gray, dense, arg (2778/30")

SH; Gray, sandy (2778/30-45")

MORGAN MUD CHECK @2778
VIS 58AWT 9.0/WL 7.2/LCM 2#
CHLORIDES: 4.300

LS; Cream/tan, very fine crystalline, sl cherty, tr stain, nsfo (2800)

LS; Gray/cream, very fine crystalline, mottled, sl dolo, tr dead oil flake (2810)

LS; Cream/tan, fine crystalline, foss, tr stain, vssfo (2820)

LS; Cream, very fine crystalline to dense, chalky, mealy, cherty (2820/15")

LS; Cream, fine crystalline to dense, chalky + SH; Gray (2820 /30-45")

DST #1
2758-2778'
5-30-10-60 min
IF: 50"
IS: 7" BLOWBACK
FF: 49"
FSI: 13" BLOWBACK
RECOVERED:
60' GIP
380' GO (10%G/90%O)
180' GMCO (10%G/85%O/5%M)
SIP: 909-908"
FP: 61-129/147-213#
HP: 1375-1315#
BHT: 99F

DRIFT SURVEY
1/2" @212'
1/2" @1257'
1/2" @2423'
1/4" @2820'