

GEOLOGIST'S REPORT

DRILLING TIME AND SAMPLE LOG

RITCHIE EXPLORATION, INC.

WELL: JOSEPH #4

LOC.: 1200' FNL & 600' FEL

SEC. 30-13-31W

GOVE COUNTY, KANSAS

API: 15-063-22185-00-00

DRILLING CONTR.: DISCOVERY RIG #1

SPUD: 03-05-14 COMP: 03-16-14

MUD UP: 2800' TYPE MUD: CHEM.

DRILL TIME: 3500 to RTD

RTD: 4675' LTD: 4578'

SAMPLES SAVED: 3600'-RTD

GEOLOGIST: ROBERT J. PETERSEN

ELEVATION

KB: 2876

GL: 2868

LOG MEASURED FROM: KB

SURFACE CASING

20# 8 5/8" Casing set @ 21' w/175 SX

PRODUCTION CASING

5 1/2" Set

WELL LOG SURVEYS

DIL/CDL

ELECTRIC LOG TOPS

FORMATION	DEPTH	DATUM	POS A	POS B	POS C
Anhydrite	2353	+523	+2	-3	+2
Base Anhydrite	2374	+502	+5	-2	+3
Heebner	3663	-987	+8	-3	+2
Toronto	3990	-1014	+3	-7	-1
Lansing	3910	-1034	+9	-6	+1
Muncie	4058	-1182	+10	-5	Flat
Stark	4146	-1270	+5	-7	+1
Marm	4238	-1362	+5	-2	+2
Pawnee	4339	-1463	+11	Flat	+4
Fort Scott	4395	-1519	+8	-2	+3
Cher SH	4423	-1547	+11	Flat	+3
Johnson	4467	-1591	+10	-2	+1
Base Johnson	4486	-1612	+9	-1	+1
Mississippian	4515	-1639	+12	-12	+14

DAILY REPORT @ 7:00 A.M.

3-5-14 MIRU, SPUD

3-6-14 636'

3-7-14 2369'

3-8-14 3408'

3-9-14 3955'

3-10-14 3982'

3-11-14 4060'

3-12-14 4120'

3-13-14 4175'

3-14-14 4268'

3-15-14 4439'

3-16-14 4553'

REFERENCE WELL:

Well A: Joseph #3 350' FNL & 1230' FEL 30-13S-13W

Well B: Joseph #1 390' FNL & 360' FEL 30-13S-13W

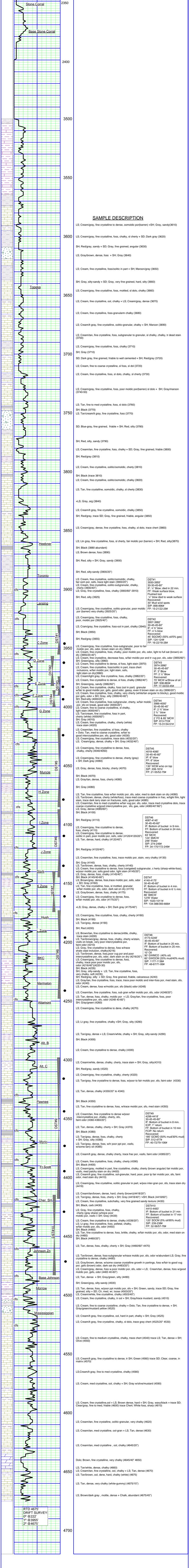
Well C: Joseph-Hess #1 1700' FSL & 175' FEL 30-13S-13W

REMARKS AND RECOMMENDATIONS

Production pipe was run by the operator to further test this well for commercial production.

Respectfully Submitted,

Robert J. Petersen



SAMPLE DESCRIPTION

LS: Cream/gray, fine crystalline to dense, oomoldic por(barren) +SH; Gray, sandy (3610)

LS: Cream/gray, fine crystalline, foss, chalky, sl cherty + SD; Dark gray (3620)

SH: Red/gray, sandy + SD; Gray, fine grained, angular (3630)

LS: Gray/brown, dense, foss + SH; Gray (3640)

LS: Cream, fine crystalline, foss/oilitic in part + SH; Maroon/gray (3650)

SH: Gray, silty-sandy + SD; Gray, very fine grained, hard, silty (3660)

LS: Cream/gray, fine crystalline, foss, mottled, sl dolo, chalky (3660)

LS: Cream, fine crystalline, ool, chalky + LS; Cream/gray, dense (3670)

LS: Cream, fine crystalline, foss-granular chalky (3680)

LS: Cream/lt gray, fine crystalline, oolitic-granular, chalky + SH; Maroon (3690)

LS: Cream/tan, fine crystalline, foss, subgranular to granular, sl chalky, chalky, tr dead stain (3700)

LS: Cream/gray, fine crystalline, foss, chalky (3710)

SH: Gray (3710)

SD: Dark gray, fine grained, friable to well cemented + SH; Red/gray (3720)

LS: Cream, fine to coarse crystalline, sl foss, sl dol (3720)

LS: Cream, fine crystalline, foss, sl dolo, chalky, sl cherty (3730)

LS: Cream/gray, fine crystalline, foss, poor moldic por(barren) sl dolo + SH; Gray/maroon (3740-50)

LS: Tan, fine to med crystalline, foss, sl dolo (3760)

SH: Black (3770)

LS: Tan/cream/lt gray, fine crystalline, foss (3770)

SD: Blue-gray, fine grained, friable + SH; Red, silty (3780)

SH: Red, silty, sandy (3790)

LS: Cream/tan, fine crystalline, foss, chalky + SD; Gray, fine grained, friable (3800)

SH: Red/gray (3810)

LS: Cream, fine crystalline, oolitic/oomoldic, cherty (3810)

SH: Black (trace 3810)

LS: Cream, fine crystalline, oolitic/oomoldic, chalky (3820)

LS: Tan, fine crystalline, oomoldic, chalky, sl cherty (3830)

+LS: Gray, arg (3840)

LS: Cream/lt gray, fine crystalline, oomoldic, chalky (3850)

SH: Red/gray, trace SD; Gray, fine grained, friable, angular (3850)

LS: Cream/gray, dense, fine crystalline, foss, chalky, sl dolo, trace chert (3860)

LS: Ln gray, fine crystalline, foss, sl cherty, fair moldic por (barren) + SH; Red, silty (3870)

SH: Black (3880 abundant)

LS: Brown dense, foss (3890)

SH: Red, silty + SH; Gray, sandy (3900)

SH: Red, silty-sandy (3900/20')

LS: Cream, fine crystalline, oolitic/oomoldic, chalky, fair com por, sso, trace light stain (3900/20')

LS: Cream, fine crystalline, oolitic/subgranular, cherty (3900/40')

LS: Gray, fine crystalline, foss, chalky (3900/60'-3910)

SH: Red, silty (3925)

LS: Cream/gray, fine crystalline, oolitic-granular, poor moldic por (barren) very chalky (3925/20')

LS: Cream/gray, fine crystalline, foss, chalky, poor, moldic por (3925/40')

LS: Cream/gray, fine crystalline, foss-ool in part, chalky (3940)

SH: Black (3950)

SH: Red/gray (3955)

LS: Cream/gray, fine crystalline, foss-subgranular, poor to fair moldic por, sfo, odor, brown stain on dry (3955)

LS: Cream, fine crystalline, foss, chalky, poor moldic por, sfo, odor, light to full sat (brown) on dry (3955/20-40')

LS: Cream, fine crystalline, decrease foss, w/air moldic por and tr vug por, sfo, odor (3955/60')

SH: Green/gray, silty (3960)

LS: Cream, fine crystalline to dense, sl foss, light stain (3970)

LS: Cream, fine crystalline, foss/oilitic in part, trace chert inclusions, w/air moldic por, light stain, sfo, light stain on dry (3980)

LS: Cream/lt gray, fine crystalline, foss, chalky (3982/20')

LS: Cream, fine crystalline to dense, sl foss, chalky (3982/40')

SH: Green/gray, sandy (3982/60')

LS: Cream, fine crystalline, ckafo, foss (ool in part) granular w/air to good moldic por, gfo, good odor, lassy, even tr brown stain on dry (3990/20')

LS: Cream, fine crystalline, foss, chalky, very cherty (whitetan angular to blocky), good moldic por gfo, odor + SH; Gray, silty (3990/40-60')

SH: Red-silty (4000/20')

LS: Cream, fine crystalline, foss subgranular, cherty, w/air moldic por, sfo on break, good odor (4000/20')

+SH; Gray (4000)

LS: Gray, fine to coarse crystalline, sl chalky, light stain (4000/40')

LS: Tan/cream, fine crystalline, foss in part, cherty (white) (4000/60')

SH: Gray (4010)

LS: Cream, fine crystalline, chalky, cherty (white) trace stain (4020)

LS: Cream/tan, fine crystalline, sl foss, chalky + Dolo; Tan, med to coarse crystalline, w/air to good intercrystalline por, sfo, good odor (4030)

LS: Cream/gray, fine crystalline, trace dolo (4032/20')

LS: Cream/gray, dense, chalky + SH; Gray (4032/40')

LS: Cream/gray, fine crystalline to dense, foss, chalky, cherty (4040/4050)

LS: Cream/gray, fine crystalline to dense, cherty (gray) + SH; Dark gray (4060)

LS: Gray, dense, foss, blocky, cherty (4070)

SH: Black (4070)

LS: Gray/tan, dense, foss, cherty (4080)

SH: Gray (4080)

LS: Tan, fine crystalline, foss w/air moldic por, sfo, odor, med to dark stain on dry (4080)

LS: Tan/brown, dense, cherty (white/foss), trace med coarse crystalline in frac, w/light film, light stain, trace dark tarry stain on fractures, sfo, good odor (4085)

LS: Cream/tan, fine to med crystalline w/air vug por, sfo, odor, trace med crystalline dolo, trace coarse crystalline w/good intercrystalline por, sfo, gas, odor (4085/40'60')

LS: Gray, dense (4085/60')

SH: Black (4100)

SH: Red/gray (4110)

LS: Cream/gray, fine crystalline to dense, foss, cherty (4110)

LS: Cream/gray, fine crystalline to dense, foss (variegated) subgranular, cherty (sharp-white-foss), w/poor moldic por, sfo, odor, dark stain on dry (4115/20')

LS: Gray, dense, foss, chalky (4145/40')

SH: Black (4145/40-60')

LS: Brown/gray, dense, foss, silty moldic por, sfo, odor, dark stain on dry (4170)

LS: Gray/brown, dense, foss, chalky (4175)

LS: Cream/gray, fine crystalline to dense, foss, w/air moldic por, sfo, odor (4175/20')

+LS: Gray, dense, chalky + SH; Dark gray (4175/40')

LS: Cream/gray, fine crystalline, foss, chalky, cherty (4180)

SH: Black (4190)

LS: Tan/gray, dense (4190)

SH: Red (4200)

SH: Brown/tan, fine crystalline to dense, brittle, chalky, trace stain (4200)

LS: Tan/brown/gray, dense, foss, chalky, cherty w/stain, vssfo on break, very poor intercrystalline por, faint odor (4210)

LS: Gray, fine crystalline to dense, foss w/trace shale clast inclusion, chalky (4216)

LS: Tan/brown, dense, foss-poor vug por and poor intercrystalline por, sfo, odor, dark stain on dry (4216/20')

LS: Cream/gray, fine crystalline to dense, foss, chalky, trace poor moldic por, sfo, odor (4216/40') (4220-30)

SH: Black (4235)

SH: Gray, silty-sandy + LS; Tan, fine crystalline, very chalky, soft (4235)

SH: Red/gray, silty + SD; Gray, fine grained, friable, calcareous (4240)

LS: Gray/tan, fine crystalline, foss, trace, trace poor moldic and inter-foss por, med stain, sfo, odor (4240)

LS: Cream, dense, foss w/moldic por, sfo (black) odor (4248)

LS: Cream/tan, fine crystalline, foss, sub gran w/air moldic por, sfo, odor (4248/20')

LS: Tan, dense, foss, chalky, moldic por + LS; Gray/tan, fine crystalline, foss, poor intercrystalline por, sfo, odor (4248 40-60')

SH: Gray/green (4260)

LS: Cream/gray, fine crystalline to dense, chalky (4270)

LS: Lt gray, fine crystalline, chalky + SH; Gray, silty (4280)

LS: Tan/gray, dense + LS; Cream/white, chalky + SH; Gray, silty-sandy (4290)

SH: Black (4300)

LS: Cream, fine crystalline to dense, chalky (4300)

LS: Cream/white, dense, chalky, cherty, trace stain + SH; Gray, silty (4310)

SH: Red/gray, sandy (4320)

LS: Cream/gray, fine crystalline, chalky, cherty (4320)

LS: Tan/gray, fine crystalline to dense, foss, w/poor to fair moldic por, sfo, faint odor (4330)

LS: Tan, dense, chalky (4330/20' to 4340)

SH: Black (4350)

LS: Tan, fine crystalline to dense, foss, w/trace moldic por, sfo, med stain (4350)

LS: Cream/tan, fine crystalline to dense w/poor intercrystalline por, chalky, cherty, sfo, faint odor (4360-4360/20')

LS: Tan, dense, chalky, cherty + SH; Gray (4370)

SH: Black (4380)

LS: Tan/gray, dense, foss, chalky, cherty + SH; Gray, silty (4380)

LS: Tan/gray, dense, foss, w/ir poor ppt por, vssfo, w/cream tarry oil (4385)

LS: Cream, fine crystalline, foss, chalky, cherty (4390)

SH: Black (4400)

LS: Cream/gray, mottled in part, fine crystalline, chalky, cherty (brown angular) fair moldic por, vssfo, med patchy stain on dry (4400)

LS: Cream/lt gray, fine crystalline, ool-granular, hard, poor, poor to fair moldic por, sfo, faint odor, med stain dry (4410)

LS: Cream/gray, fine crystalline, oolitic granular in part, w/poor inter-gran por, sfo, trace stain dry (4418)

LS: Cream/tan/brown, dense, hard, cherty (brown) (4418/20')

LS: Tan/gray, dense, foss, cherty + SH; Gray (4418/40') +SH; Black (4418/60')

LS: Cream, fine crystalline, subchaly, very fine grained sandy texture (4430)

SH: Black, carb (4430)

LS: Gray, fine crystalline, foss, chalky, cherty (gray sharp) w/trace poor moldic por, vssfo + SH; Gray (4439)

LS: Cream, fine crystalline to dense, chalky (4339/20')

LS: Lt gray, fine crystalline, foss, palledal, chalky, w/air moldic por, sfo, odor (4450)

SH: Black (4460)

LS: Tan, fine crystalline to dense, foss, brittle, chalky, w/air moldic por, sfo, odor, med stain on dry (4460)

SH: Black (4460/20')

LS: Tan, dense, foss, chalky, cherty + SH; Gray (4460/60'-4470)

LS: Tan/brown, dense, foss-subgranular w/trace moldic por, sfo, odor w/abundant LS; Gray, fine crystalline to dense, chalky (4480)

LS: Gray/brown, dense, w/some coarse crystalline growth in partings, foss w/air to good vug por, gfo (brown) odor, dark sat dry (4483/20')

LS: Cream/gray, dense, foss w/poor moldic por, sfo, odor + LS; Cream/tan, dense, foss w/good moldic por, gfo, odor (4483 40-60')

LS: Tan, dense + SH; Gray/green, silty (4490)

SH: Green/gray, sandy (4500)

LS: Tan, dense, foss, w/poor ppt moldic por, sfo + SH; Green, sandy, trace SD; Gray, fine grained, silty + SD; Clr, med, wr, loose (4503/20')

LS: Cream/white, fine crystalline, chalky (4503/40')

LS: Cream, fine crystalline, chalky, tr ool + SH; Gray/trace mustard, sandy (4510)

LS: Cream, fine to coarse crystalline, chalky + Dolo; Tan, fine crystalline to dense, + SH; Gray/green/mustard (4520)

LS: Cream/lt gray, fine crystalline, ool, hard in part, chalky + SH; Gray (4525)

LS: Cream/lt gray, fine crystalline, chalky, sl dolo, trace gray chert (4525/20' 4530)

LS: Cream, fine to medium crystalline, chalky, trace chert (4540) trace LS; Tan, dense + SH; Olive (4550)

LS: Cream/lt gray, fine to med crystalline, w/air (4580)

LS: Cream, med crystalline, ool, chalky + SH; Gray w/olive/mustard (4590)

LS: Cream, fine crystalline, ool + LS; Brown dense, hard + SH; Gray, waxily + trace SD; Clear/gray, fine to med, friable (4600) trace Chert, White foss, sharp (4610)

LS: Cream/tan, fine crystalline, oolitic-crystalline, very chalky (4620)

LS: Cream/tan, med crystalline, ool-gran + LS; Tan, dense (4630)

LS: Cream/tan, med crystalline, ool, chalky (4645/20')

Dolo; Brown, fine crystalline, very chalky (4645/40' 4650)

LS: Tan/white, dense, chalky (4660)

LS: Cream/tan, fine crystalline, ool, chalky + LS; Tan, dense (4670)

LS: Tan/brown, ool, dense, hard, chalky (white) (4675)

LS: Tan, dense, very chalky (white-gummy) (4675/15')

LS: Brown/dark gray, mottle, dense + Chalk, abundant (4675/45')

RTD 4675' DRIFT SURVEY
0° @ 2225'
1° @ 3955'
2° @ 4675'

DIP: 124-124#
SIP: 898-898#
FP: 15-21/22-29#

DIP: 17-33/33-45#
SIP: 898-898#
FP: 15-21/22-29#

DIP: 30-45-45-60'
IF: 4 3/4" blow
FF: 5' blow
Recovered: 45' SGC/MO (55% oil/5% gas)
SIP: 124-124#
FP: 17-33/33-45#

DIP: 30-45-45-60'
IF: 2 1/2" blow
FF: 2 1/2" blow
Recovered: 2' FO & 85' MCW
SIP: 813-772#
FP: 15-31/34-51#

DIP: 30-45-45-60'
IF: 6" blow
Recovered: 130' WCW w/slo on top
SIP: 274-249#
FP: 21-55/52-79#

DIP: 30-45-45-60'
IF: Bottom of bucket in 9 min.
FF: Bottom of bucket in 24 min.
Recovered: 63' MCW
SIP: 124-124#
248' Water
SIP: 274-249#
FP: 34-170/172-249#

DIP: 30-45-45-60'
IF: Bottom of bucket in 4 min.
FF: Bottom of bucket in 6 1/2 min.
Recovered: 86' SMCW
1278' Water
SIP: 1020-1011#
FP: 134-389/393-66#

DIP: 30-45-45-60'
IF: Bottom of bucket in 25 min.
FF: Bottom of bucket in 25 min.
Recovered: 10' Oil
30' GWOCMO (40% oil)
60' GWOCMO (20% mud/40% mud)
SIP: 512-477#
FP: 48-67/71-99#

DIP: 30-45-45-60'
IF: Bottom of bucket in 8 min.
ICIP: 1" return
FF: Bottom of bucket in 10 min
Recovered: 185' GC/MO (50% mud/30% mud)
SIP: 512-477#
FP: 52-72/75-106#