





# Musgrove

**PETROLEUM  
CORPORATION**  
Clafin, Kansas

COMPANY: H&D Exploration LLC

LEASE: Julian #2

FIELD: Taylorville

LOCATION: W2-Se-Sw-Nw (2310' FNL & 690' FWL)

SEC: 28 TWSP: 25s RGE: 12w

COUNTY: Stafford STATE: Kansas

KB: 1874 GL: 1865

API # 15-185-23840-00-00

CONTRACTOR: Southwind Drilling Company (Rig # 2)

Spud: 11/22/2013 Comp: 12/03/2013

RTD: 4586 LTD: 4284

Mud Up: 2800' Type Mud: Chemical was displaced

Samples Saved From: 3200' to RTD

Drilling Time Kept From: 3200' to RTD

Samples Examined From: 3200' to RTD

Geological Supervision From: 3200' to RTD

Geologist on Well: Josh Austin

Surface Casing: 8 5/8" @ 701'

Production Casing: 5 1/2" @ 4277'

Electronic Surveys: By Pioneer Energy Services(hit bridge @ 2558 no logs)

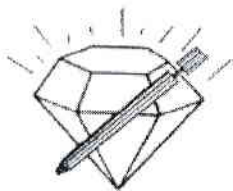
## H&D Exploration, LLC

# Well comparison sheet

DRILLING WELL Julian #2					COMPARISON WELL Julian #1			
1874 KB					1873 KB		Structural Relationship	
Formation	Sample	Sub-Sea	Log	Sub-Sea	Sample	Sub-Sea	Sample	Log
Heebner	3413	-1539	3414	-1540	3402	-1529	-10	-11
Toronto	3430	-1556	3430	-1556	3420	-1547	-9	-9
Douglas	3452	-1578	3451	-1577	3442	-1569	-9	-8
Brown Lime	3577	-1703	3575	-1701	3560	-1687	-16	-14
Lansing	3597	-1723	3602	-1728	3581	-1708	-15	-20
Base KC	3893	-2019	3892	-2018	3886	-2013	-6	-5
Mississippi	3960	-2086	3960	-2086	3958	-2085	-1	-1
Kinderhook	4012	-2138	4014	-2140	4009	-2136	-2	-4
Viola	4040	-2166	4038	-2164	4031	-2158	-8	-6
Simpson Shale	4124	-2250	4128	-2254	4097	-2224	-26	-30
Simpson Sand	4158	-2284	4150	-2276	4130	-2257	-27	-19
Arbuckle	4202	-2328	4204	-2330	4187	-2314	-14	-16
Total Depth	4586	-2712	4284	-2410	4240	-2367		

### NOTES

On the basis of the low structural position, lack of shows in the samples and drill stem test and after evaluating the electric logs, it was recommended by all parties involved in the Julian #2 to drill deeper in the Arbuckle and run 5 1/2' casing for a saltwater disposal well.



**DIAMOND TESTING**  
 P.O. Box 157  
 HOISINGTON, KANSAS 67544  
 (800) 542-7313  
**DRILL-STEM TEST TICKET**  
 FILE: julian2dst1

TIME ON: 08:43  
 TIME OFF: 15:32

Company H & D Exploration Lease & Well No. Julian #2  
 Contractor Southwind Rig #2 Charge to H & D Exploration  
 Elevation 1865 GL Formation Lan H-J Effective Pay -- Ft. Ticket No. S0417  
 Date 12-1-13 Sec. 28 Twp. 25 S Range 12 W County Stafford State KANSAS  
 Test Approved By Josh Austin Diamond Representative Jacob McCallie

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Formation Test No. 1 Interval Tested from 3735 ft. to 3815 ft. Total Depth 3815 ft.  
 Packer Depth 3730 ft. Size 6 3/4 in. Packer depth -- ft. Size 6 3/4 in.  
 Packer Depth 3735 ft. Size 6 3/4 in. Packer depth -- ft. Size 6 3/4 in.

Depth of Selective Zone Set \_\_\_\_\_

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Top Recorder Depth (Inside) 3723 ft. Recorder Number 5515 Cap. 5,000 P.S.I.  
 Bottom Recorder Depth (Outside) 3801 ft. Recorder Number 5586 Cap. 5,000 P.S.I.  
 Below Straddle Recorder Depth \_\_\_\_\_ ft. Recorder Number \_\_\_\_\_ Cap. \_\_\_\_\_ P.S.I.

Mud Type CHEMICAL Viscosity 44 Drill Collar Length -- ft. I.D. 2 1/4 in.  
 Weight 9.4 Water Loss 11.2 cc. Weight Pipe Length -- ft. I.D. 2 7/8 irr  
 Chlorides 10,400 P.P.M. Drill Pipe Length 3709 ft. I.D. 3 1/2 in  
 Jars: Make STERLING Serial Number N/A Test Tool Length 26 ft. Tool Size 3 1/2-IF in  
 Did Well Flow? NO Reversed Out NO Anchor Length 80 (17a) ft. Size 4 1/2-FH irr  
 Main Hole Size 7 7/8 Tool Joint Size 4 1/2 XH in. Surface Choke Size 1 in. Bottom Choke Size 5/8 in

Blow: 1st Open: 1/2" Blow- Built to 4 1/4" in 30 min **NOBB**  
 2nd Open: 1/4" Blow- Built to 2 3/4" in 30 min **NOBB**

Recovered 55 ft of SLOWWCM 1% O 15% W 84% M

Recovered      ft of     

Recovered      ft of     

Recovered      ft of PH: 7

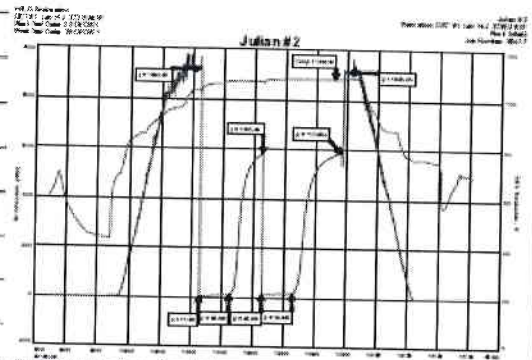
Recovered      ft of RW: .18 @ 55 degrees F

Recovered      ft of Chlorides: 43,000 ppm

Remarks:     

Diesel in Bucket

Tool Sample: 2% O 34% W 64% M



Time Set Packer(s) 11:09 AM A.M. Time Started Off Bottom 1:24 PM P.M. Maximum Temperature 108

Initial Hydrostatic Pressure..... (A) 1834 P.S.I.  
 Initial Flow Period..... Minutes 30 (B) 12 P.S.I. to (C) 26 P.S.I.  
 Initial Closed In Period..... Minutes 30 (D) 1165 P.S.I.  
 Final Flow Period..... Minutes 30 (E) 30 P.S.I. to (F) 39 P.S.I.  
 Final Closed In Period..... Minutes 45 (G) 1175 P.S.I.  
 Final Hydrostatic Pressure..... (H) 1825 P.S.I.



**DIAMOND TESTING**  
 P.O. Box 157  
 HOISINGTON, KANSAS 67544  
 (800) 542-7313  
**DRILL-STEM TEST TICKET**  
 FILE: julian2dst2

TIME ON: 08:46  
 TIME OFF: 15:13

Company H & D Exploration Lease & Well No. Julian #2  
 Contractor Southwind Rig #2 Charge to H & D Exploration  
 Elevation 1865 GL Formation Miss Effective Pay -- Ft. Ticket No. S0418  
 Date 12-2-13 Sec. 28 Twp. 25 S Range 12 W County Stafford State KANSAS  
 Test Approved By Josh Austin Diamond Representative Jacob McCallie

Formation Test No. 2 Interval Tested from 3940 ft. to 4030 ft. Total Depth 4030 ft.  
 Packer Depth 3935 ft. Size 6 3/4 in. Packer depth -- ft. Size 6 3/4 in.  
 Packer Depth 3940 ft. Size 6 3/4 in. Packer depth -- ft. Size 6 3/4 in.  
 Depth of Selective Zone Set     

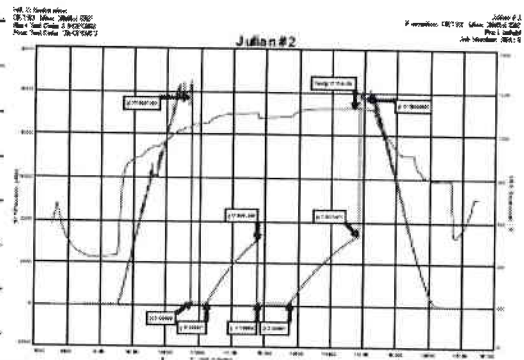
Top Recorder Depth (Inside) 3928 ft. Recorder Number 5515 Cap. 5,000 P.S.I.  
 Bottom Recorder Depth (Outside) 4006 ft. Recorder Number 5586 Cap. 5,000 P.S.I.  
 Below Straddle Recorder Depth      ft. Recorder Number      Cap.      P.S.I.

Mud Type CHEMICAL Viscosity 46 Drill Collar Length -- ft. I.D. 2 1/4 in.  
 Weight 9.6 Water Loss 11.6 cc. Weight Pipe Length -- ft. I.D. 2 7/8 irr  
 Chlorides 11,100 P.P.M. Drill Pipe Length 3914 ft. I.D. 3 1/2 in

Unions \_\_\_\_\_ P.P.M. \_\_\_\_\_ Unit Pipe Length \_\_\_\_\_ ft. I.D. \_\_\_\_\_ in  
 Jars: Make STERLING Serial Number N/A Test Tool Length 26 ft. Tool Size 3 1/2-F in  
 Did Well Flow? NO Reversed Out NO Anchor Length 90 (27a) ft. Size 4 1/2-FH in  
 Main Hole Size 7 7/8 Tool Joint Size 4 1/2 XH in. Surface Choke Size 1 in. Bottom Choke Size 5/8 in

Blow: 1st Open: 3" Blow- Built to BB in 1 min NOBB  
 2nd Open: BB Immediate NOBB

Recovered 2631 ft. of GIP  
 Recovered 35 ft. of Mud 100% M  
 Recovered 35 ft. of TOTAL FLUID  
 Recovered \_\_\_\_\_ ft. of \_\_\_\_\_  
 Recovered \_\_\_\_\_ ft. of \_\_\_\_\_  
 Recovered \_\_\_\_\_ ft. of \_\_\_\_\_



Remarks: Diesel in Bucket  
 Tool Sample: 100% M

Time Set Packer(s) 10:52 AM A.M. / P.M. Time Started Off Bottom 1:22 PM A.M. / P.M. Maximum Temperature 113  
 Initial Hydrostatic Pressure ..... (A) 1942 P.S.I.  
 Initial Flow Period ..... Minutes 15 (B) 22 P.S.I. to (C) 22 P.S.I.  
 Initial Closed In Period ..... Minutes 45 (D) 621 P.S.I.  
 Final Flow Period ..... Minutes 30 (E) 19 P.S.I. to (F) 24 P.S.I.  
 Final Closed In Period ..... Minutes 60 (G) 671 P.S.I.  
 Final Hydrostatic Pressure ..... (H) 1943 P.S.I.

**ROCK TYPES**

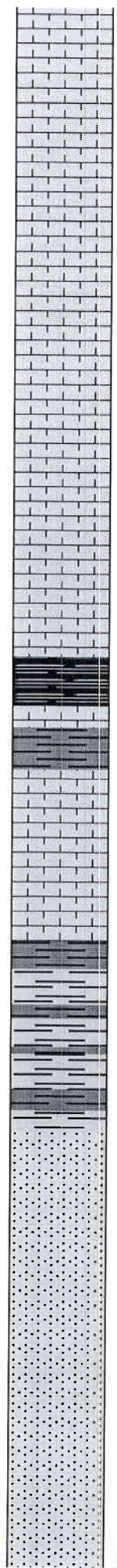
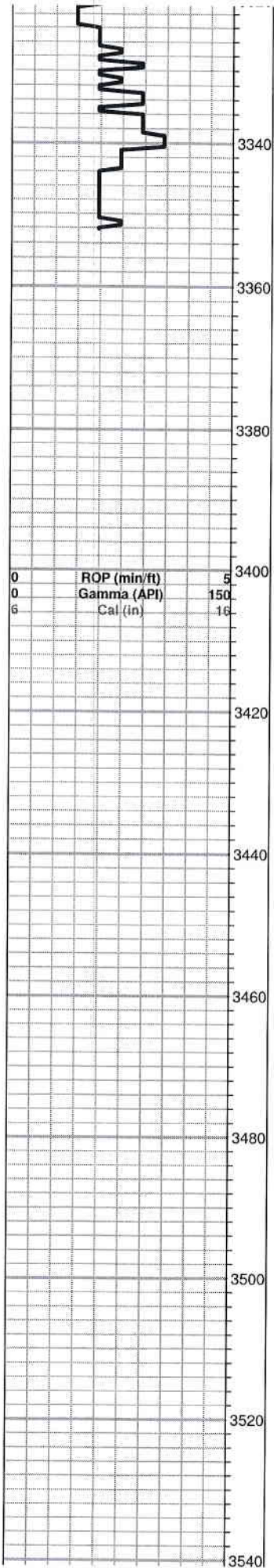
Cht	Lmst fw7>	shale, gry	shale, red
Dolsec	shale, grn	Carbon Sh	Ss

**OTHER SYMBOLS**

- Oil Show**
- Even Stn
- Spotted Stn 50-75
- Spotted Stn 25-50
- Spotted Stn 1-25
- Questionable Stn
- Dead Oil Stn
- Fluorescence
- \* Gas
  
- DST**
- DST Int
- DST alt
- Core
- || tail pipe

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Curve Track #1	ROP (min/ft)	Gamma (API)	Cal (in)	Depth   Intervals	DST	Lithology	Oil Show	Geological Descriptions	TG, C1 - C5	
1:240 Imperial			Cored Interval						1:240 Imperial	
0			ROP (min/ft)	5					Total Gas (units)	
0			Gamma (API)	150					C1 (units)	
6			Cal (in)	16					C2 (units)	
									C3 (units)	
									C4 (units)	
									3320	



Limestone; grey, fine xln, fossiliferous, chalky in part, dense, poor visible porosity, no shows

Limestone; cream, fine-medium xln, granular, chalky, oolitic in part, no shows, plus white chalk

Limestone; cream-buff, fine-medium xln, slightly fossiliferous, dense, plus grey-white boney Chert

**HEEBNER 3413 (-1539)**  
black carboniferous shale

grey-maroon shale

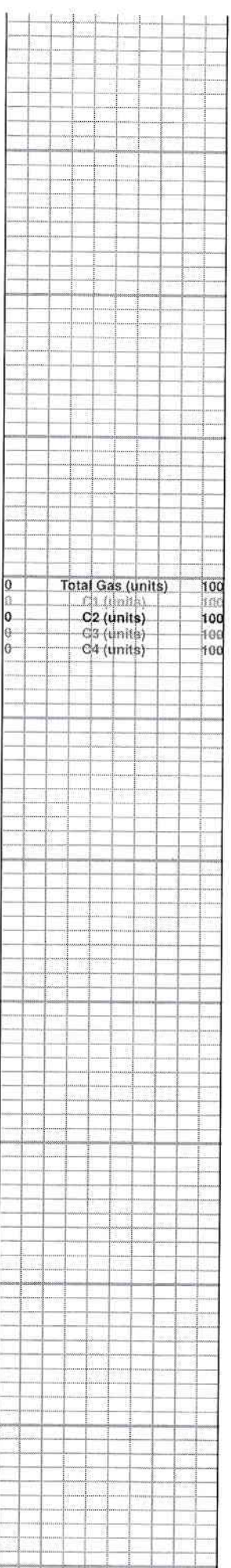
**TORONTO 3430 (-1568)**  
Limestone; white-cream-lt. grey, fine-medium xln, chalky, few scattered porosity, plus white chalk no shows

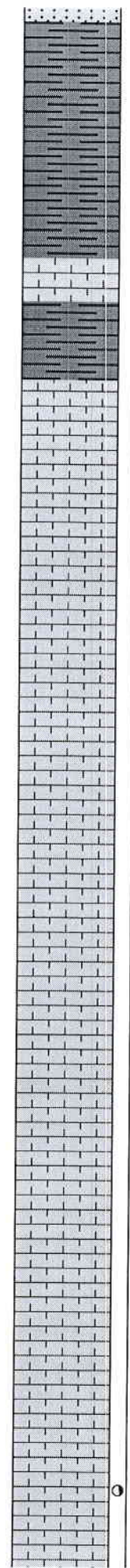
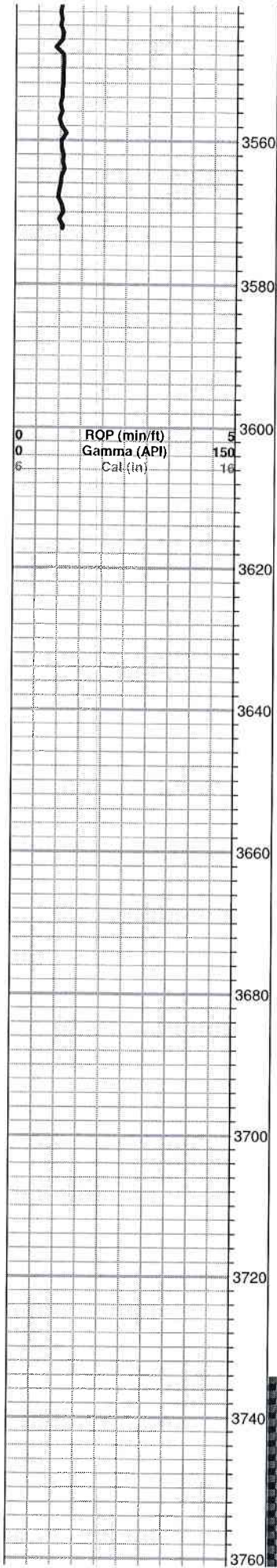
**DOUGLAS SHALE 3452 (-1578)**  
Shale; grey-green-maroon, soft, silty in part, few micaceous pieces

**DOUGLAS SAND**  
Sand; grey-dark grey, micaceous, silty, dense, shaley in part

Sand; lt. grey-grey, very fine grained, sub rounded, sub angular, few silty pieces, miaceous, no shows

Sand as above





Shale; grey-lt. grey-dark grey, soft, silty, micaceous

**BROWN LIME 3577 (-1703)**

Limestone; tan-greyish brown, fine xln, dense, cherty, fossiliferous in part

**LANSING 3597 (-1723)**

Limestone; cream, fine xln, chalky, fossiliferous, few recrystallized pieces, sparry calcite, poorly developed porosity, no shows

Limestone; cream-grey, few scattered porosity, cherty in part, trace tan fossiliferous Chert, no shows

Limestone; cream-tan, fine xln, chalky in part, dense, poor porosity, cherty, no shows

Limestone; grey-buff, fine xln, fossiliferous, dense, poorly developed porosity, trace spotty brown stain, nsfo, plus Chert, grey, fossiliferous

Limestone; cream-buff-grey, fine xln, finely oolitic-fossiliferous, cherty, no visible porosity, dense, plus Chert; grey-cream, fossiliferous in part

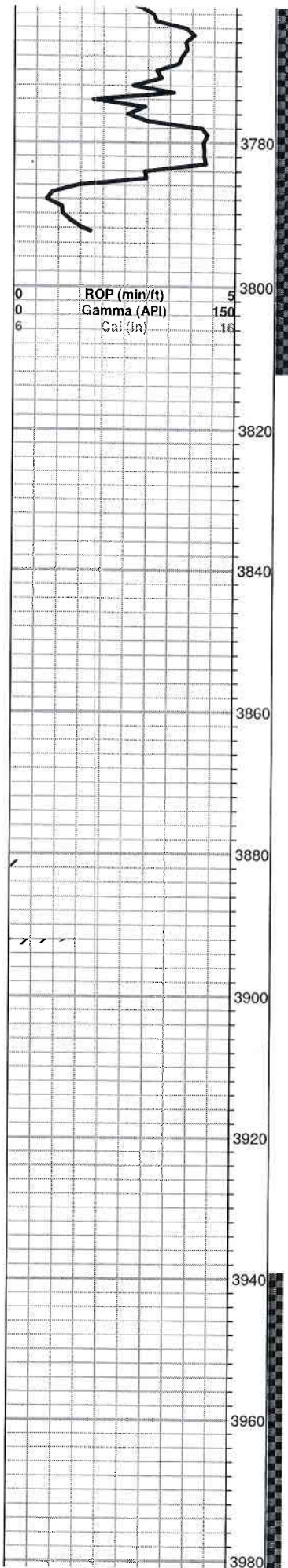
Limestone and Chert as above

Limestone; cream-buff-grey, fine xln, finely oolitic-fossiliferous, dense, plus Chert; grey-cream

Limestone; grey-buff, finely fossiliferous, dense, cherty, poor visible porosity, plus grey fossiliferous Chert

Limestone; buff, highly oolitic, chalky in part, poorly deviated porosity, trace brown stain, trace spotty free oil, very faint odor

0	Total Gas (units)	100
0	C1 (units)	100
0	C2 (units)	100
0	C3 (units)	100
0	C4 (units)	100



Limestone; cream-white, fine-medium xln, chalky, few inter xln type porosity, golden brown stain, trace spotty free oil, faint odor when broke

Limestone; cream, oolitic in part, scattered inter xln- few oomoldic type porosity, no shows

Limestone; cream-white-grey, fine xln, dense, slightly cherty, plus white chalk, no shows

Limestone; cream-grey, fine xln, chalky, finely oolitic-fossiliferous, fair-good fossil cast type porosity no shows

Limestone; cream-buff, fine xln, dense, cherty, slightly fossiliferous no visible porosity, no shows

black carboniferous shale

Limestone; tan-buff, fine xln, dense, poorly developed porosity, brown stain, NSFO, no odor

black carboniferous shale

Limestone; cream, fine xln, dense, shaley

**BASE KANSAS CITY 3893 (-2019)**

Shale; grey-dark grey-black

Limestone; cream-"limey" green, fine xln, chalky, dense, plus Chert white-cream, boney, trace black-dark brown stain

Limestone; as above, plus Chert; cream-tan-orange, boney

Limestone; cream-white, fine xln, chalky, slightly fossiliferous, poorly developed porosity, no shows

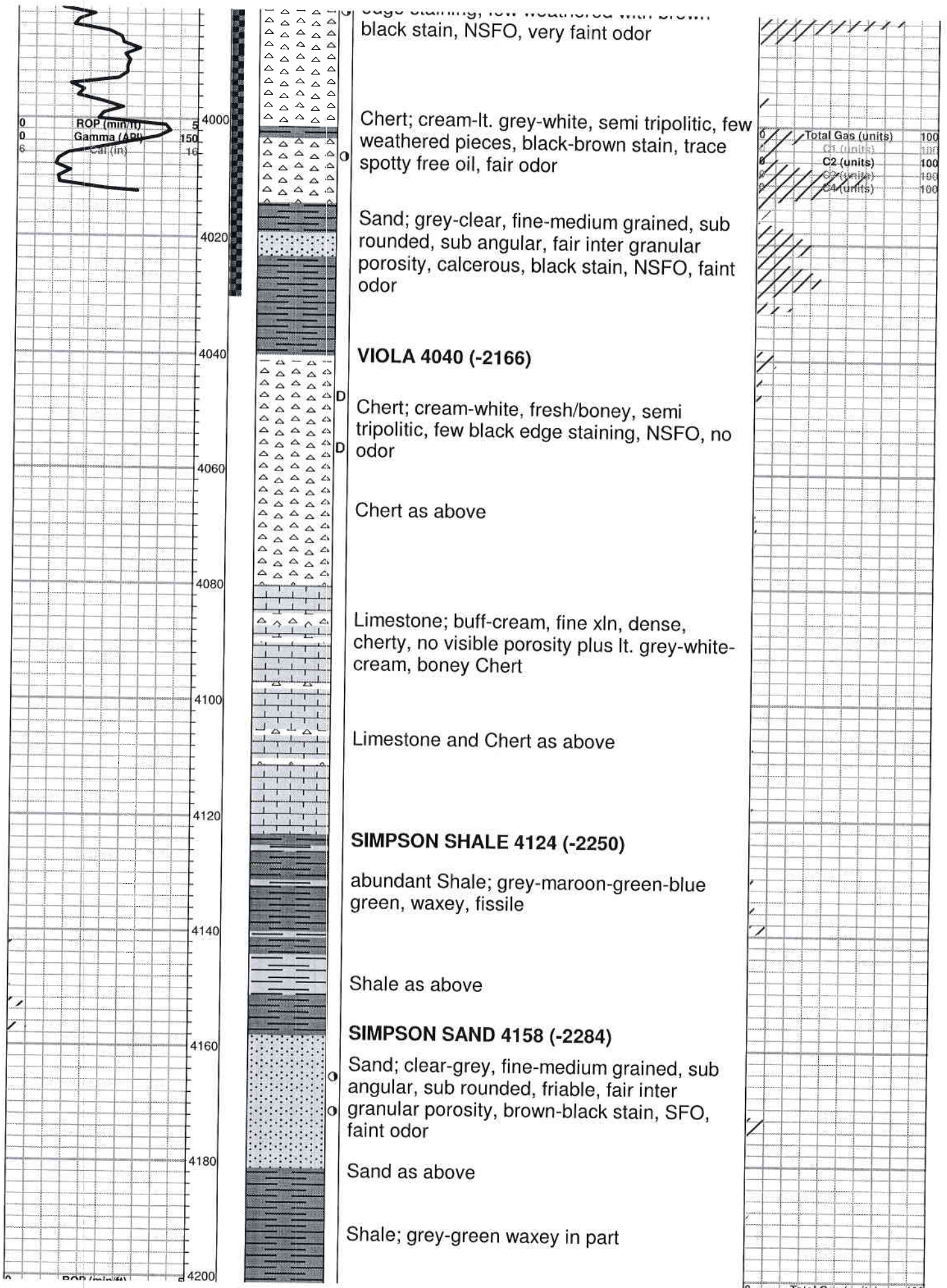
Shale; grey-green-maroon-purple

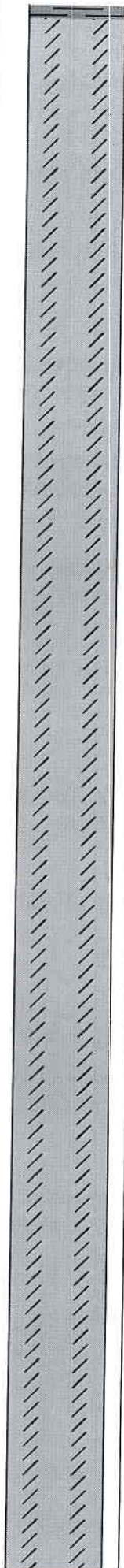
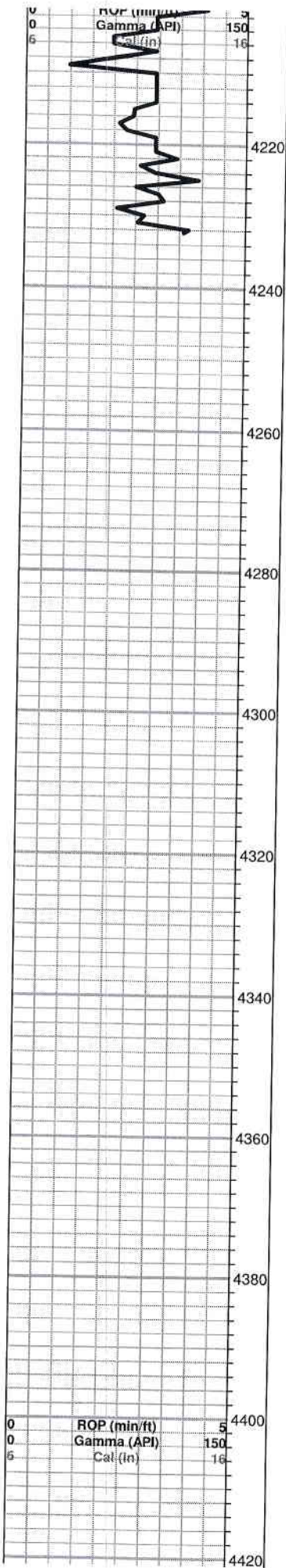
**MISSISSIPPI 3960 (-2086)**

Chert; white-cream, tripolitic, boney, black edge staining few weathered with brown-

0	Total Gas (units)	100
0	C1 (units)	100
0	C2 (units)	100
0	C3 (units)	100
0	C4 (units)	100







**ARBUCKLE 4202 (-2328)**

Dolomite; grey-cream-buff, fine xln, dense, scattered vuggy-oomoldic porosity, no shows

plus Chert; white, oolitic, boney

Dolomite; buff-grey, fine-medium xln, dense, few inter xln porosity, no shows

Dolomite; as above plus Chert, white-grey, boney, no shows

Dolomite; grey-cream-buff, few scattered oomoldic-vuggy type porosity, no shows

Dolomite; cream, fine xln, sucrosic, dense, poor porosity no shows

Dolomite; as above

Dolomite; grey-buff, fine medium xln, fair inter xln porosity, no shows, trace lt grey chert

as above

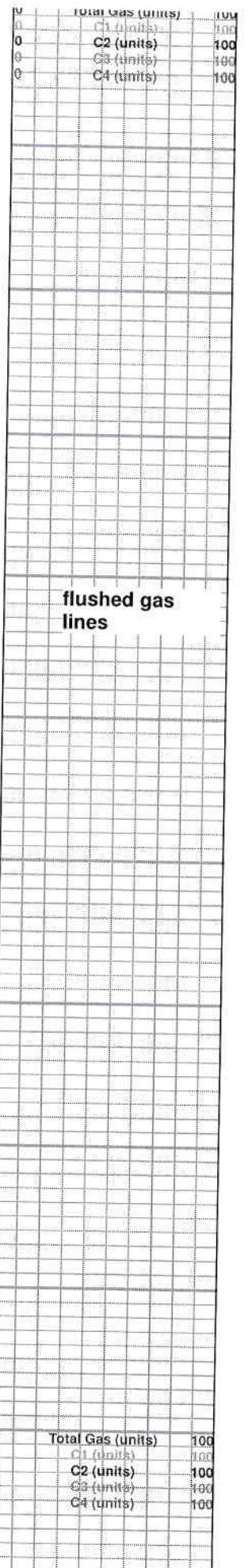
Dolomite; white-tan, fine xln, slightly sucrosic, few inter xln porosity, plus white boney Chert

Dolomite and Chert as above

Dolomite; cream-white, granular/sandy, few scattered porosity, plus white bonwy Chert

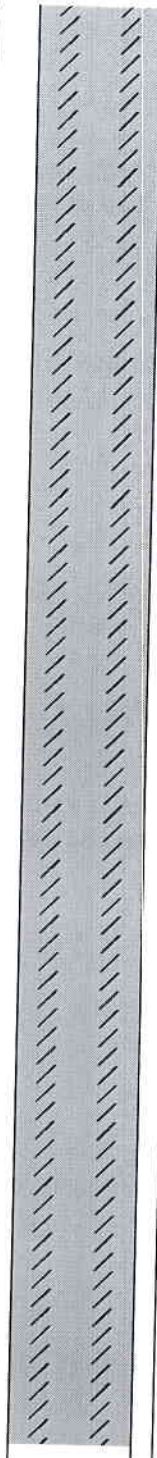
Dolomite; cream-buff, fine-medium xln, sandy-granular in part, fair inter xln porosity

Dolomite; cream-tan-buff, fine xln, dense, slightly sucrosic, poor visible porosity





4440  
4460  
4480  
4500  
4520  
4540  
4560  
4580



as above

Dolomite; cream-tan, fine-medium xln, dense, poorly developed porosity, trace grey-white Chert

Dolomite; cream, fine xln, sucrosic, dense, trace inter xln porosity

Dolomite as above; grey-cream

Dolomite; cream-tan, fine-medium xln, dense, scattered inter xln porosity, trace grey-white Chert

as above

Dolomite; cream-tan-grey, fine-medium xln, inter xln porosity, white Chert

Chert and Dolomite as above