

R#8

#1096 - Murfin Drilling Company, Inc. - Operator
CARTER-COLLIVER UNIT #1 (CO¹) MV Partners
 660' FSL - 1320' FEL SE/4
 Sec. 28-14S-13W
 Russell County, Kansas

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Spud: 2:30 p.m. 09/23/00

- 1.0000000

KCC

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 TIGHT HOLE

- 09/22/00 To move in 09/23/00.
- 09/23/00 MIRT, MDC.
- 09/24/00 Depth: 800'. Cut: 800'. D.T.: 0 hrs. C.T.: 0 hrs. Dev.: None.
- 09/25/00 Drlg.: 1435'. Cut: 635'. D.T.: 3-1/2 hrs. - Bit inspection @ 1391'. Hole tite on trip. Bit was OK - just drilling slow. C.T.: 0 hrs. Dev.: 1/2" @ 900' and 1" @ 1435'.
- 09/26/00 Drlg.: 1735'. Cut: 300'. D.T.: 12 hrs. - WOC. C.T.: 0 hrs. Ran 32 jts. 8-5/8" surface casing set @ 1435'. Cement w/ 650 sx Comm, 3% cc, 2% gel. Circulated 100 bbl, by Allied. Plug down @ 12:00 p.m., 09/25/00. Drilled out plug @ 12:00 a.m., 09/26/00.
- 09/27/00 Drlg.: 2490'. Cut: 755'. D.T.: 3/4 hrs. - Displace @ 2100'. C.T.: 1-3/4 hrs. Dev.: None.
- 09/28/00 Drlg.: 2871'. Cut: 381'. D.T.: 0 hrs. C.T.: 8 hrs. Dev.: 3/4" @ 2871'. Began coring @ 2871'.
- 09/29/00 Drlg.: 2904'. Cut: 33'. D.T.: 0 hrs. C.T.: 24 hrs. Dev.: None. Cor #1 from 2871' to 2894'. Had trouble closing pressure Core #1 - had Allied out and pressured up to 2,500' ± and wouldn't close. TOH and finally closed. Core #2 from 2894' to 2904'. Reamed from 2871' - 2904'. TIH w/ Core #3 @ 7:00 a.m. @ 2904'.
- 09/30/00 Drlg.: 2954'. Cut: 50'. D.T.: 0 hrs. C.T.: 24 hrs. Dev.: None. Core #3 from 2904' to 2914'. Reamed and drilled. Core #4 from 2949' - 2954'. Recovered 5'.
- 10/01/00 RTD: 3115'. Cut: 161'. D.T.: 0 hrs. C.T.: 15-1/4 hrs. Dev.: 3/4" @ 3115'. Core #5 from 2954' - 2981'. Recovered 27'. HC @ 9:15 p.m., 09/30/00. Logging began @ 1:30 a.m.
- 10/02/00 RTD: 3115'. C.T.: 16-1/4 hrs. Logging: 1:30 a.m. to 1:00 p.m., 10/01/00, by Schlumberger. Ran 71 jts. 5-1/2" production casing set @ 3114', by Acid Services. Cement w/ 160 sx Lead and 100 sx Tail. Plug down @ 9:15 p.m., 10/01/00. Rig released @ 11:15 p.m., 10/01/00.

FORMATION	CARTER-COLLIVER #1 - CO ¹			REFERENCE WELL	
	660' FSL - 1320' FEL SE/4			SKELLY	
	Sec. 28-14S-13W			#18 COLLIVER	
	LOG TOP	DATUM	REF	S/2 S/2 SE of 28-14-13W	DATUM
Anhydrite	664	+1069	+1	655	+1068
Base Anhydrite	696	-1037	-6	680	+1043
Herington	1479	+254	-5	1464	+259
Winfield	1524	+209	-1	1513	+210
Towanda	1590	+143	-3	1577	+146
Ft. Riley	1630	+103	-3	1617	+106
Wreford	1765	-32	-4	1751	-28
Council Grove	1812	-79	-2	1800	-77
Neva				1927	-204
Foraker	2046	-313	-5	2031	-308
Penn	2196	-463	-22	2164	-441
Stotler	2215	-482	+1	2202	-479
Tarkio	2286	-553	-3	2274	-551
Emporia	2352	-619	-2	2340	-617
Bern	2422	-689	Flat	2412	-689
Howard	2493	-760			
Severy Shale	2544	-811			
Topeka	2556	-823	Flat	2546	-823
Oread	2706	-973	+1	2697	-974
Heebner	2790	-1057	+1	2781	-1058
Toronto	2810	-1077	-2	2798	-1075
Lansing A	2860	-1127	Flat	2850	-1127
Lansing B	2870	-1137	+7	2867	-1144
Lansing C	2890	-1157	+3	2883	-1160
Lansing G	2954	-1221			
Lansing H	3010	-1277			
Lansing I	3032	-1299			
Lansing J	3050	-1317			
Lansing K	3084	-1351			
RTD	3115	-1382			

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GENS. SE. MOD POR.
MOD SPH. VIT LUSTER.
CALC / LOCAL CEMENT.
PT GEN CONTACTS. SPT.
MSC INCLUSIONS.
FR VIS POR.

ORIGINAL

STRAID: 2887.10'
BOND: 2889.65'
DIFF: 2.55'
HOLE DEV: 4.0° @ 2871'

LZASING
2862' (-1130)

CORE #1
(2871' - 92')

Vis 54 section. WL 9.2° PK
Lose Loss: 4.8 HL 130"
PV: 16 YP: 16 Gels: 10/24
PH: 10.2 CI (1M)
Ca* (40) Solids: 5.2%

T/I w BIT. CLEAN BOTTOM
(3ct. ASD Per-Mix)

CORE #2
(2892' - 2904')

(REDUCE PUMP MUD LEVELS
TO TEMP.)

CORE #3
(2904' - 14')

H/W: 122w / φu (20) BK
C1: 103w / 0w (1) PIX
C2: 70w / 0w (1) PIX
C3: 18w / 0w (1) PIX

AIR IN PUMP. (MS
FEATHY MUD (OIL + GAS)

* WHILE REAMING 2904' - 14'
GOT 308w H/W.

CFS @ 2949': 40"

CORE #4
(2949' - 54')

CORE #5
(2954' - 80')

CFS @ 2954': 40"

CFS @ 2980': 15"

Vis 49 section. WL 8.0° PK
Lose Loss: 4.8 HL 130"
PV: 12 YP: 16 Gels: 8/20
PH: 10.2 CI (500)
Ca* (40) Solids: 3.2%

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Vis 48 section. WL 9.0° PK

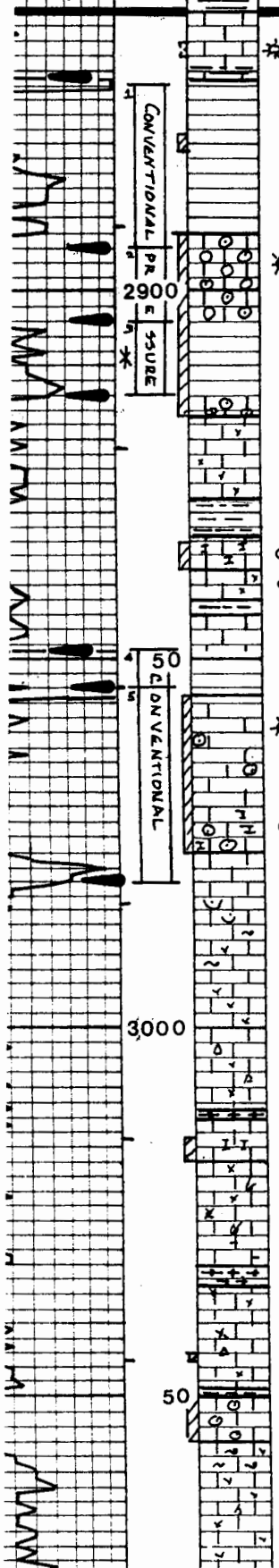
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LS - TAN. SING. MICRO-XCN.
XCN POR. + TA-XCN. + SU-
CROSIC. FINE TRIPR VIT POR.
FRIGD ODR. AIC. BANG FRAG.
GAS BUBBLES. NO OIL. NO STAIN.
SPTD DULL YEL FLDR. WK (C)
CUT PRES. WK CH ACID PRES.

FEWPCS:

LS - TAN / OFF WHITE VF OOLITES. CCI
TAN MATRIX. OPAQUE TO TRANS-
PARENT. - MIXED WITH - VF OOLI-
TES. SOME B-XCN. FEASIBLE. GOOD
VIS POR. GOOD POR. UNIFORM H/
YEL FLDR. SLOW + AC. FREE LT
BENDIL. RARE GAS. UNIFORM LT

STAIN. STAINING (?) CUT PRES. STAINING.
(?) ACID PRES. OIL BLENDS ON
WASH WATER.

LS - TAN / OFF WHITE VF OOLITES. CCI
TAN MATRIX. OPAQUE TO TRANS-
PARENT. DENSE. SOME B-XCN. NOITE
VIS POR.

LS - TAN. SING. MICRO-XCN. XCN POR.
IN RE-OPEN. IN FOSIL FRAGS. DENSE.
NOITE VIS POR.

SH - MED GRAY. CALC.
LS - LT GRAY / TAN. MOD. MICRO-XCN. XCN
POR. CHECK. FEASIBLE. TR VIS POR.
ONLY LT BEND STAIN.

LS - BENT TAN. SING. MOD. MICRO-
CEN POR. XCN POR. DENSE.
IN RE-OPEN. NOITE VIS POR. SPTD
STAIN. BEND] WASH FRAGS.

FEWPCS:

LS - TAN / OFF WHITE VF OOLITES. CCI
TAN MATRIX. TRANSPARENT.
SOME B-XCN. & TR VIS POR.
FRIGD. SPTD / UNIFORM YEL
FLDR. AIC. SOME LT BEND BOW
OIL. NO STAIN. FEASIBLE. SPTD LT BEND
STAIN. WK (?) CUT PRES. WK (C)
ACID PRES. - GEDDING - TO STAINING.

- MIXED WITH -
LS - WHITE. SING. MICRO-XCN.
XCN POR. FEASIBLE TR
(MS) VIS POR. ONLY SPTD (FRAGS)
LT BEND STAIN.

LS - TAN / LT GRAY. SING. MOD.
MICRO-XCN. XCN + TA PART
POR. B-XCN. IN VF 'GHOST'
OOLITES. DENSE. NOITE
VIS POR.

(ADD: 6 CHEST)

SH - BLK. CARB. SOFT.
LS - LT GRAY / TAN. SING.
MICRO-XCN. XCN POR.
IN TA-XCN. IN BANG. IN
FOSIL FRAGS. & CHECK.
MOSTLY DENSE. MOSTLY
NO TR VIS POR.

SH - VDK GRAY. BLK - CARB. SOFT.
LS - TAN / LT GRAY. SING. TA-F-1
MOSTLY MICRO-XCN. XCN POR.
IN CHECK. MOSTLY NO TR
VIS POR.

SH - BK GRAY. SOFT.
LS - TAN. SING. MICRO-XCN.
XCN POR. + PART POR.
TAN VF OOLITES. - GRADU-
TO - MICRO-XCN / CR4PTC -
XCN. B-XCN. FR VIS
POR AT TOP. NOITE W/
DEPTH.

D. Williams

Murfin Drilling Company, Inc.
Carter Collier #1 CO2 I

The following tables list the results from routine (Dean-Stark) core analysis for pressure cores #1 and #2 and the retort analysis conducted on samples from the first pressure core. The top section of the core consisted of micrite with smaller sections of consolidated limestone.

The retort analysis, table 2, was performed on samples taken from the bottom interval of each measured foot of core. Retort analysis was performed in conjunction with the whole core Dean-Stark analysis so a comparison of the results between the two methods could be evaluated.

Whole core Dean-Stark analysis was performed on the remaining core. Each foot section was placed in individual whole core Dean-Stark units. The values of porosity, grain density and fluid saturations, table 1, are for the whole one-foot interval, (minus the retort sample). Permeabilities were measured on competent samples within the one-foot intervals. Sample depths listed in table 1 are for the permeability samples.

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CONSERVATION DIVISION
Topeka, Kansas

Table 1. Routine Core Analysis Results Pressure Core #1

Sample Number	Sample Depth (ft)	Sample Length (in)	Sample Diameter (in)	Porosity (%)	Grain Density (g/cc)	Gas Permeability (md)			Water (%)	Oil (%)
						K_v^1	Direction K_{max}^2	K_{90}^3		
1	2894.1-.25	1.940	2.470	32.54	2.75	94.91	101.04	94.63	47.57	7.13
2	2895	n/a	n/a	27.14	2.69	n/a	n/a	n/a	74.24	15.04
3	2896.15-.3	2.184	2.472	27.72	2.70	8.74	32.36	29.44	66.67	10.88
4	2897	0.933	2.42	29.82	2.71	177.18	n/a	n/a	64.49	10.06
5	2898.2-.3	1.392	2.453	29.14	2.71	10.12	19.94	18.96	75.37	12.02
6	2899.0-.15	2.017	2.464	16.95	2.70	0.42	12.98	8.55	86.97	9.57
7	2900.5-.65	1.909	2.468	22.17	2.69	2.16	7.63	5.87	77.97	14.73
8	2901.45-.65	2.495	2.45	19.44	2.70	0.17	1.60	1.37	55.39	9.04
9	2902.0-.15	2.113	2.455	20.69	2.70	0.57	1.40	0.77	69.86	11.85
10	2903.0-.20	2.745	2.462	22.02	2.68	0.75	2.35	1.62	43.55	10.49

- ¹ K_v = vertical permeability
- ² K_{max} = maximum permeability in horizontal direction
- ³ K_{90} = 90° in horizontal plane to K_{max}

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Table 2. Retort Analysis Results Pressure Core #1

Sample Number	Depth (feet)	Bulk Density (gms/cm ³)	Grain Density (gms/cm ³)	Interstitial			Bound Water (% of BV)	
				Effective Porosity (% of BV)	Water Saturation (% of PV)	Oil Saturation (% of PV)		Gas Saturation (% of PV)
1	2894.9	2.18	2.75	30.4	78.7	8.4	12.8	0.9
2	2895.9	2.14	2.69	29.2	75.4	14.0	10.5	0.4
3	2896.9	2.24	2.70	24.6	73.0	13.1	14.0	0.2
4	2897.9	2.16	2.71	28.6	72.1	11.0	16.9	0.2
5	2898.9	2.20	2.71	26.9	73.8	13.6	12.6	0.0
6	2899.9	2.36	2.70	18.9	82.0	8.7	9.3	0.5
7	2900.9	2.09	2.69	35.3	91.2	8.7	0.1	0.4
8	2901.9	2.40	2.70	15.7	67.9	12.1	20.1	0.7
9	2902.9	2.06	2.70	37.3	93.9	6.0	0.1	0.2
10	2903.9	2.34	2.68	17.9	66.6	14.1	19.3	0.5

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Table 1. Routine Core Analysis Results Core #2

Sample Number	Sample Depth (ft)	Sample Length (in)	Sample Diameter (in)	Porosity (%)	Grain Density (g/cc)	Gas Permeability (md)			Water (%)	Oil (%)
						K_v^4	Direction K_{max}^5	K_{90}^6		
11	2904-05	3.998	2.471	16.36	2.70	0.25	0.34	0.15	76.57	6.41
12	2905-06	3.904	2.473	14.87	2.69	0.37	0.73	0.17	83.47	7.82
13	2906-07	3.984	2.476	10.49	2.70	0.03	0.07	0.04	85.29	7.33
14	2907-08	3.888	2.463	8.49	2.70	0.02	0.07	0.05	76.38	10.33
15	2908-09	3.938	2.476	6.98	2.70	0.01	0.06	0.05	79.25	8.24
16	2909-10	4.022	2.479	2.54	2.69	0.01	0.15	0.05	89.22	3.34
17	2910-11	3.446	2.482	1.20	2.70	0.03	0.09	0.06	88.92	2.32
18	2911-12	3.620	2.427	1.57	2.70	0.01	0.04	0.03	88.46	7.20
19	2912-13	3.959	2.477	1.22	2.70	0.01	0.04	0.02	79.89	13.74
20	2913-14	3.997	2.480	1.45	2.70	0.01	0.01	0.01	71.07	11.93
21	2914-14.2	2.353	2.480	1.33	2.69	0.01	0.04	0.01	84.87	11.15

⁴ K_v = vertical permeability

⁵ K_{max} = maximum permeability in horizontal direction

⁶ K_{90} = 90° in horizontal plane to K_{max}

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