

CORE LABORATORIES, INC.
 Petroleum Reservoir Engineering
 DALLAS, TEXAS

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CORE ANALYSIS RESULTS

Company ATLANTIC-RICHFIELD COMPANY Formation HORSESHOE GALLUP FORM. COR. RE. 2-2674
 Well HORSESHOE GALLUP UNIT 286 Core Type 2 5/8" DIAMOND DIST. 10-2-74
 Field HORSESHOE GALLUP Drilling Fluid WATER BASE MUD Analysts W. DONOVAN
 County SAN JUAN State NEW MEX. Elev. 5546 GL Location 2540' FSL & 2570 FFL

Lithological Abbreviations

SAND-SD SHALE-SH LIME-LM	DOLOMITE-DOL CHERT-CH GYPSUM-GYP	ANHYDRITE-ANHY CONGLOMERATE-CONG FOSSILIFEROUS-FOSS	SANDY-SOY SHALY-SHY LIMY-LMY	FINE-FN MEDIUM-MED COARSE-CSE	CRYSTALLINE-XLN GRAIN-GRN GRANULAR-GRNL	BROWN-BRN GRAY-GY VUGGY-VGY	FRACTURED-FRAC LAMINATION-LAM STYLOLITIC-STY	SLIGHTLY-SL/ VERY-V/ WITH-W/
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SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYs (K _a)	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
1 WC	1245.6-46.5	0.6	9.9	0.0	31.7	SS-m gy, f-m gr, calc cmt, S&P, sh incl, cly infl,
2 WC	47.5-48.4	1.3	15.7	6.8	51.5	SS-dk gy, f gr, cly mtx, sh incl, tr pyr, sl calc,
3 WC	48.4-49.0	0.2	10.2	7.6	47.0	SS-m gy, f gr, calc cmt, S&P, sh incl,
4 WC	49.0-50.0	0.6	13.5	4.5	46.0	SS-m gy, f-m gr, cly mtx, S&P, sh incl, tr cht, sl calc,
5 WC	50.0-50.5	0.5	9.9	3.1	44.0	SS-m gy, f gr, calc cmt, S&P, sh incl, tr cht,
6 WC	53.0-54.0	2.2	15.2	2.7	35.2	SS-m gy, f-m gr, calc cmt, S&P, sh incl, horz sh lam,
12 CA	53.0-54.0	1.6	12.4	8.9	40.5	SS-m gy- lt gy, m gr, calc cmt, S&P, sh incl, tr glauc,
7 WC	55.0-56.0	0.6	14.2	1.5	41.8	SS-m gy, f-m gr, calc cmt, S&P, sh incl,
8 WC	56.0-57.0	0.5	12.6	2.6	57.1	SS-dk gy, f-vf gr, cly mtx, contorted sh lam, burrows,
13 CA	57.0-58.0	1.4	5.0	10.0	40.0	SS-lt gy, m gr, calc cmt, sh incl, tr glauc, tr pyr, tr cont. sh lam,
9 WC	58.0-59.0	0.3	13.4	0.0	52.9	SS-m gy, f-m gr, calc cmt, S&P, cly infl, sh incl, tr glauc,
14 CA	59.0-60.0	269.0	16.0	10.6	48.1	SS-lt gy-tan, f-m gr, calc cmt, S&P, sh incl, tr glauc,
10 WC	60.0-61.0	7.4	11.4	4.7	40.8	SS-m gy, f gr, calc cmt, S&P, sh incl,
11 WC	61.0-62.0	363.0	18.6	3.2	44.3	SS-m gy-tan, f gr, calc cmt, S&P, sh incl, tr cht,
12 WC	62.0-63.0	1.3	13.5	5.6	67.4	SS-m gy, f gr, calc cmt, S&P, sh incl, cont sh lam,
13 WC	63.0-64.0	0.6	12.6	4.1	63.2	SS-m gy, f gr, calc cmt, S&P, sh incl, tr glauc,
14 WC	65.0-66.0	4.0	16.3	9.9	47.5	SS-m gy, f gr, calc cmt, sh incl, horz sh lam,
15 WC	66.0-67.0	1.9	15.7	4.5	53.5	SS-m gy, f gr, calc cmt, sh incl, cont sh lam,
15 CA	66.0-67.0	2.6	10.7	8.4	54.2	SS-m gy, m-f gr, calc cmt, S&P, sh incl, tr glauc, burrows, distorted sh lam,
16 WC	67.0-68.0	2.0	20.8	0.0	40.6	SS-m gy, f gr, calc cmt, sh incl, cont sh lam,

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Petroleum Reservoir Engineering
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CORE ANALYSIS RESULTS

Company ATLANTIC-RICHFIELD COMPANY Formation HORSESHOE GALLUP File RP-3-2674
 Well HORSESHOE GALLUP UNIT 286 Core Type 2 5/8" DIAMOND Date Report 10-2-74
 Field HORSESHOE GALLUP Drilling Fluid WATER BASE MUD Analysts W. DONOWAN
 County SAN JUAN State NEW MEX. Elev. 5546 GL Location 2540" FSL & 2570 FEL

Lithological Abbreviations

SAND-SD SHALE-SH LIME-LM DOLOMITE-DOL CHERT-CH GYPSUM-GYP ANHYDRITE-ANHY CONGLOMERATE-CONG FOSSILIFEROUS-FOSS SANDY-SDY SHALY-SHY LIMY-LMY FINE-FN MEDIUM-MED COARSE-CSE CRYSTALLINE-XLN GRAIN-GRN GRANULAR-GRNL BROWN-BRN GRAY-GY VUGGY-VGY FRACTURED-FRAC LAMINATION-LAM STYLOLITIC-STY SLIGHTLY-SL VERT-V WITH-W/

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYs (K _a)	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
17 WC	1268.0-69.0	1.8	14.9	5.4	51.6	SS-m gy, f gr, calc cmt, sh incl, tr glauc, cont sh lam,
18 WC	69.0-70.0	1.1	12.4	9.4	55.9	SS-m gy, f gr, calc cmt, sh incl, tr glauc, cont sh lam,
19 WC	70.0-71.0	0.5	12.2	4.1	60.8	SS-m gy, f gr, calc cmt, S&P, sh incl, tr glauc, cont sh lam,
20 WC	1273.0-74.0	0.5	12.0	0.0	59.1	SS-m gy, f gr, calc cmt, S&P, sh incl, tr glauc, cont sh lam,
21 WC	1360.0-61.0	202.0	22.5	6.0	43.4	SS-m gy-tan, f gr, cly mtx, S&P, sh incl, tr calc,
1 CA	60.0-61.0	196.0	23.2	19.0	31.9	SS-m gy-tan, f-m gr, cly mtx, S&P, sh incl, tr glauc, horz sh lam,
2 CA	61.0-62.0	150.0	24.4	16.8	32.4	SS-m gy-tan, f-m gr, cly mtx, S&P, sh incl, tr glauc,
22 WC	62.0-63.0	141.0	30.7	6.2	43.4	SS-m gy-tan, f-m gr, cly mtx, S&P, sh incl, tr calc,
23 WC	63.0-64.0	75.0	32.1	11.2	44.0	SS-m gy-tan, f gr, cly mtx, S&P, sh incl,
3 CA	64.0-65.0	531.0	25.6	14.5	37.5	SS-m gy-tan, f-m gr, cly mtx, S&P, sh lam, tr glauc,
4 CA	65.0-66.0	249.0	25.2	12.7	38.9	SS-m gy-tan, f-m gr, cly mtx, S&P, sh incl, tr glauc,
24 WC	66.0-67.0	0.2	15.1	7.6	25.5	SS-m gy, f gr, calc cmt, S&P, sh incl,
5 CA	67.0-68.0	112.0	23.5	14.5	37.8	SS-m gy-tan, f-m gr, cly mtx, S&P, sh incl, tr glauc, horz sh lam,
25 WC	68.0-69.0	190.0	33.2	11.2	42.2	SS-m gy-tan, f-m gr, cly mtx, S&P, sh incl,
26 WC	69.0-70.0	150.0	22.8	9.2	45.3	SS-m gy-tan, f-m gr, cly mtx, S&P, sh incl,
27 WC	70.0-71.0	1.0	17.6	5.1	43.2	SS-m gy-tan, f-m gr, cly mtx, S&P, sh incl,
6 CA	71.0-72.0	11.2	23.5	11.9	36.6	SS-lt gy, f gr, calc cmt, S&P, sh incl tr glauc,
28 WC	72.0-73.0	1.1	20.8	6.1	52.9	SS-m gy-dk gy, f-vf gr, cly mtx, S&P, sh incl, cont sh lam,
7 CA	73.0-74.0	192.0	21.8	13.8	45.0	SS-lt gy-tan, f-m gr, cly mtx, S&P, sh incl, tr glauc,
29 WC	74.0-75.0	0.8	15.8	5.2	61.9	SS-m gy-dk gy, f-vf gr, cly mtx, S&P, sh incl, cont sh lam,

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CORE ANALYSIS RESULTS

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 County SAN JUAN State NEW MEX Elev. 5546 GL Location 2540' FSL & 2570' FEL
SEC. 30, T31N-R16W

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SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
		(K) a				
8 CA	1375.0-76.0	1.0	23.4	23.0	31.2	SS-m gy, f gr, cly mtx, tr sh incl, tr glauc, wvy sh lam,
30 WC	76.0-77.0	0.8	14.7	6.9	47.9	SS-m gy, f-vf gr, cly mtx, S&P, sh incl, cont sh lam,
31 WC	77.0-78.0	0.7	14.0	5.9	39.4	SS-m gy, f-vf gr, calc cnt, S&P, sh incl
32 WC	78.0-79.0	0.3	12.4	12.0	43.1	SS-m gy, f-vf gr, calc cnt, S&P, sh incl,
9 CA	79.0-80.0	5.9	14.8	5.5	57.4	SS-m gy, f-vf gr, cly mtx, sh incl, tr glauc, wvy sh lam,
33 WC	80.0-81.0	0.4	14.4	10.0	40.7	SS-m gy, f-vf gr, calc cnt, S&P, sh incl,
10 CA	81.0-81.5	2.0	12.4	7.3	50.8	SS-m gy, f gr, cly mtx/calc ip, S&P, sh incl, tr glauc,
11 CA	81.5-81.6	0.6	1.9	10.5	52.6	SS-dk gy, slt-vf gr, calc cnt, cont sh lam,

CA DENOTES CONVENTIONAL CORE ANALYSIS
 WC DENOTES WHOLE CORE ANALYSIS