CORE ANALYSIS RESULTS

for

CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
File Number: 57121-8512

Cozzette & Cocoran

Western Atlas International
A Litton/Dresser Company

CORE LABORATORIES

Western Atlas International

CORE LABORATORIES

October 18, 1990

CER Corporation
950 Grier Drive
Las Vegas, NV 89119

Attention: Mr. G. C. Kukal

Subject:

Core Analysis Results
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
File Number: 57121-8512

Gentlemen:

In a letter dated September 28, 1990 Core Laboratories was requested to perform the following analyses:

1. Core Gamma Surface Log
2. Unsteady State (CMS-300) Gas Permeability and Porosity

The results of these tests are presented in tabular and graphical format within this report. This report is subdivided into two divisions with Section I containing CMS-300 plug data at 800 psi overburden pressure and Section II containing CMS-300 plug data at 3500 psi overburden pressure. Laboratory test conditions may be found on the Analytical Procedures and Quality Assurance page to better assist you in your evaluation of these data.

It has been a pleasure serving CER Corporation and we look forward to working with you on any future projects. If you have any questions pertaining to these test results or if we may be of further assistance, please contact us at (303)751-9334.

Sincerely,

Daniel J. Scott
Project Coordinator

DJS/sso

Additional Testing Recommendations

Upon review of conventional core analyses results and based upon experience with the particular formation, the following special core analysis tests are recommended for further reservoir evaluation:

1) It is recommended that the mineralogy of a select group of samples be determined through petrographic analyses to identify any problematic minerals which may be present. In addition, the abundances of the individual clay minerals can be provided by X-ray diffraction. Scanning electron microscopy will assist in defining the relative position of any deleterious minerals within the pore system to ascertain potential completion and/or production problems.

2) For an independent assessment of reservoir water saturation values, it is recommended that capillary pressure determinations be performed on a representative group of samples. Capillary pressure results will help define the distribution of hydrocarbons in the subsurface by characterizing the hydrocarbon column as a function of height above the free water level, as defined in the literature (Pc = 0). Information may also be developed concerning seal and barrier rock capacity, secondary migration and entrapment, and up-dip and down-dip limits of hydrocarbon accumulation, all useful in field development.

3) Formation resistivity analyses are recommended for definition of "a", "m", and "n" parameters, which are used in the equation to calculate formation water saturations from downhole log response. Values can be obtained at simulated reservoir stress conditions.

4) Rock (pore volume) compressibility analyses are recommended in order to compute pore volume reduction during pressure depletion of a reservoir.

Please contact us at (303) 751-9334 for additional information or to discuss any of the above recommendations.

CORE MEASUREMENT SYSTEM (CMS) - 300

$$\text{POROSITY} = \frac{\text{DIRECT MEASURED PORE VOLUME}}{\text{BULK VOLUME}} \times 100$$

$$\text{POROSITY} = \frac{\text{HELIUM INJECTED INTO PORE SPACE BY CMS}}{\text{PORE VOLUME FROM CMS + BOYLE'S LAW GRAIN VOLUME}}$$

NOTE: THIS EQUATION CORRECTS FOR BULK VOLUME REDUCTION AS OVERBURDEN PRESSURE IS APPLIED.

K_∞ = EQUIVALENT NON-REACTIVE LIQUID PERMEABILITY DETERMINED BY THE CMS AT UP TO EIGHT DESIGNATED NET OVERBURDEN CONFINING STRESSES. THIS IS AN IMPROVED FLOW CAPACITY INDICATOR AS GAS SLIPPAGE EFFECTS PRESENT AT LOW LABORATORY PORE PRESSURE (AND NOT IN THE RESERVOIR) HAVE BEEN ELIMINATED.

K_{AIR} = AN ESTIMATED AIR PERMEABILITY APPROXIMATING HISTORICALLY FURNISHED CORE ANALYSIS PERMEABILITY. (THIS IS AN OPTIMISTIC VALUE. LOW PORE PRESSURES IN HISTORICAL LABORATORY MEASUREMENTS RESULT IN GAS SLIPPAGE NOT PRESENT AT RESERVOIR CONDITIONS, AND HENCE HIGH PERMEABILITY VALUES.)

b = A TERM DEPENDENT ON (1) PORE GEOMETRY AND (2) GAS UTILIZED IN THE PERMEABILITY MEASUREMENT THAT LINKS K_∞ AND K_{AIR} AS FOLLOWS:

$$K_{AIR} = K\infty \left(1 + \frac{b_{AIR}}{P_{MEAN}} \right)$$

P_{MEAN} = THE MEAN PORE PRESSURE WHICH IS EQUIVALENT TO THE AVERAGE OF THE UPSTREAM AND DOWNSTREAM PRESSURE OF THE CORE BEING TESTED. THIS VALUE IS LOWER IN A TYPICAL LABORATORY DETERMINATION THAN IN THE RESERVOIR.

BETA = FORCHEIMER INERTIAL TERM, NEEDED TO ACCOUNT FOR LOST FLOW RATE DUE TO GAS INERTIAL AND/OR KINETIC EFFECTS AS GAS FLOWS THROUGH ROCK PORES.

SECTION I

CMS-300 PLUG DATA

800 PSI OVERBURDEN PRESSURE

CORE LABORATORIES

Company : CER Corporation/Fuelco
Well : FEE E-22-10-94-S
Location : Sec. 22 T10S R94W
Co,State : Mesa, Colorado

Field : Plateau Creek
Formation : As Noted
Coring Fluid : Water Base Mud
Elevation :

File No.: 57121-8512
Date : 12-Oct-1990
API No. :
Analysts: PD DW MW RR

CORE ANALYSIS RESULTS

(HYDROSTATIC CONFINEMENT)

SAMPLE NUMBER	DEPTH ft	NET OVERBURDEN (800 psi) K∞ md	Kair md	φ %	POROSITY (HELIUM) %	GRAIN DENSITY gm/cc	DESCRIPTION
		Core No. 1	Cozzette Sandstone		6904.0'-6960.0'	Cut 56.0' Rec. 56.0'	
1	6920.7	0.009	0.020	3.3	3.1	2.77	Sst dk gry vf-f gr carb arg abdnt pyr
2	6921.7	0.018	0.035	6.7	6.8	2.71	Sst gry vf-f gr arg bioturb pyr
3	6922.6	0.009	0.021	6.4	6.7	2.70	Sst gry vf-f gr arg bioturb pyr
4	6923.5	0.024	0.041	5.8	6.2	2.73	Sst gry vf-f gr arg bioturb pyr
5	6925.0	0.023	0.038	7.2	6.4	2.70	Sst gry vf-f gr arg bioturb pyr
6	6929.5	0.022	0.043	8.9	9.5	2.67	Sst lt gry vf gr arg
7	6930.5	0.018	0.037	10.1	10.2	2.71	Sst lt gry vf gr arg
8	6931.5	0.011	0.020	6.8	6.6	2.72	Sst lt gry vf gr arg bioturb
9	6932.5	0.014	0.032	9.4	9.3	2.70	Sst lt gry vf gr arg
10	6933.5	0.025	0.048	8.9	9.0	2.68	Sst lt gry vf gr arg
11	6934.5	0.169	0.275	9.5	9.5	2.69	Sst lt gry vf gr arg
12	6935.5	0.027	0.052	8.7	9.0	2.69	Sst lt gry vf gr arg
13	6936.5	0.026	0.054	9.0	9.1	2.70	Sst lt gry vf gr arg
14	6937.5	0.017	0.041	9.1	9.2	2.71	Sst lt gry vf gr arg
+ 15	6938.5				10.3	2.71	Sst lt gry vf gr arg
16	6939.5	0.039	0.079	10.4	10.7	2.70	Sst lt gry vf gr arg
17	6940.5	0.015	0.039	10.1	10.4	2.71	Sst lt gry vf gr arg
18	6941.5	0.024	0.053	10.8	9.5	2.71	Sst lt gry vf gr arg
19	6944.5	0.010	0.020	7.2	7.3	2.71	Sst gry vf gr arg sh lam
20	6945.5	1.76	2.12	2.8	3.9	2.67	Sst gry vf gr arg sh lam
21	6946.5	0.038	0.069	9.8	9.8	2.69	Sst lt gry vf gr arg
22	6947.5	0.011	0.028	9.3	9.4	2.69	Sst lt gry vf gr arg

CORE LABORATORIES

Company : CER Corporation/Fuelco
Well : FEE E-22-10-94-S

Field : Plateau Creek
Formation : As Noted

File No.: 57121-8512
Date : 12-Oct-1990

CORE ANALYSIS RESULTS

(HYDROSTATIC CONFINEMENT)

SAMPLE NUMBER	DEPTH	NET OVERBURDEN (800 psi)			POROSITY (HELIUM)	GRAIN DENSITY	DESCRIPTION
		K∞	Kair	φ			
	ft	md	md	%	%	gm/cc	
23	6948.5	0.006	0.013	8.2	8.2	2.69	Sst lt gry vf gr arg bioturb
24	6949.5	0.009	0.015	5.6	5.4	2.68	Sst lt gry vf gr arg bioturb sh lam
25	6955.5	0.035	0.058	6.0	6.3	2.69	Sst lt gry vf gr arg sh lam
26	6956.5	0.019	0.040	9.0	9.0	2.68	Sst lt gry vf gr arg
27	6957.5	0.019	0.045	9.5	9.4	2.69	Sst lt gry vf gr arg
		Core No. 2	Corcoran Sandstone 7092.0'-7150.4'				Cut 58.4' Rec. 58.4'
28	7092.5	0.003	0.008	3.6	3.2	2.68	Sst dk gry vf gr arg carb
29	7094.0	0.004	0.009	2.7	2.8	2.70	Sst dk gry vf gr arg carb bioturb
30	7095.0	0.005	0.013	3.0	2.9	2.69	Sltst dk gry arg sh sli sst
31	7096.0	0.016	0.021	3.0	3.1	2.69	Sltst dk gry arg sh sli sst
32	7097.5	0.007	0.017	3.9	2.9	2.70	Sst dk gry vf gr arg sh
33	7110.5	<.001	0.003	2.9	3.0	2.70	Sst dk gry vf gr arg sh
34	7112.0	0.005	0.013	3.5	3.3	2.72	Sst dk gry vf gr arg sh
35	7116.0	0.006	0.015	3.6	3.5	2.72	Sst gry vf gr arg sh
36	7117.0	0.010	0.022	3.3	3.4	2.71	Sst gry vf gr arg sh
37	7118.0	0.019	0.024	4.2	3.5	2.72	Sst gry vf gr arg sh
38	7120.0	0.008	0.014	4.4	4.4	2.70	Sst gry vf gr arg
39	7121.5	0.013	0.019	5.3	5.4	2.70	Sst gry vf gr arg
+ 40	7126.0				5.0	2.71	Sst gry vf gr arg
41	7129.5	0.011	0.014	5.6	5.4	2.71	Sst gry vf gr arg
42	7135.5	0.010	0.022	3.3	3.0	2.70	Sst gry vf gr arg sh
+ 43	7139.5				4.3	2.69	Sst gry vf gr arg
44	7143.5	0.010	0.014	6.9	6.9	2.70	Sst gry vf gr arg
45	7148.5	0.009	0.021	3.9	3.9	2.71	Sst gry vf gr arg sh

CORE LABORATORIES

Company : CER Corporation/Fuelco
Well : FEE E-22-10-94-S

Field : Plateau Creek
Formation : As Noted

File No.: 57121-8512
Date : 12-Oct-1990

CORE ANALYSIS RESULTS

(HYDROSTATIC CONFINEMENT)

SAMPLE NUMBER	DEPTH	NET OVERBURDEN (800 psi)			POROSITY (HELIUM)	GRAIN DENSITY	DESCRIPTION
		K∞	Kair	ϕ			
	ft	md	md	%	%	gm/cc	

+ Denotes Sample Unsuitable For CMS-300 Measurements

CORE LABORATORIES

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Formation : As Noted

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TABLE I

SUMMARY OF CORE DATA

ZONE AND CUTOFF DATA

ZONE:

Identification --------	Cozzette
Top Depth ----------	6919.0 ft
Bottom Depth ----------	6958.0 ft
Number of Samples --------	27

DATA TYPE:

Porosity ----------	ϕ (800 psi)
Permeability ----------	K_∞ (800 psi)

CUTOFFS:

Porosity (Minimum) -------	0.0 %
Porosity (Maximum) -------	100.0 %
Permeability (Minimum) ---	0.0000 md
Permeability (Maximum) ---	100000. md
Water Saturation (Maximum)	
Oil Saturation (Minimum) -	
Grain Density (Minimum) --	2.00 gm/cc
Grain Density (Maximum) --	3.00 gm/cc
Lithology Excluded -------	NONE

CHARACTERISTICS REMAINING AFTER CUTOFFS

ZONE:

Number of Samples -----	26
Thickness Represented -	26.0 ft

POROSITY:

Storage Capacity ------	208.5 ϕ-ft
Arithmetic Average ----	8.0 %
Minimum ----------	2.8 %
Maximum ----------	10.8 %
Median ----------	8.9 %
Standard Deviation ----	±2.1 %

GRAIN DENSITY:

Arithmetic Average ----	2.70 gm/cc
Minimum ----------	2.67 gm/cc
Maximum ----------	2.77 gm/cc
Median ----------	2.70 gm/cc
Standard Deviation ----	±0.02 gm/cc

PERMEABILITY:

Flow Capacity ---------	2.4 md-ft
Arithmetic Average ----	0.092 md
Geometric Average -----	0.023 md
Harmonic Average ------	0.016 md
Minimum ----------	0.006 md
Maximum ----------	1.76 md
Median ----------	0.019 md
Standard Dev. (Geom) --	$K \cdot 10^{\pm 0.481}$ md

HETEROGENEITY (Permeability):

Dykstra-Parsons Var. --	0.446
Lorenz Coefficient ----	0.817

AVERAGE SATURATIONS (Pore Volume):

Oil ----------	
Water ----------	

CORE LABORATORIES

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Location : Sec. 22 T10S R94W
Co,State : Mesa, Colorado

Field : Plateau Creek
Formation : As Noted
Coring Fluid : Water Base Mud
Elevation :

File No.: 57121-8512
Date : 12-Oct-1990
API No. :
Analysts: PD DW MW RR

CMS - 300 TEST DATA

SAMPLE NUMBER	DEPTH ft	NOB PRESSURE psi	PORE VOLUME cc	POROSITY %	K∞ md	Kair(est) md	b (He) psi	BETA ft(-1)	ALPHA microns
1	6920.7	800.0	0.80	3.3	0.009	0.020	99.94		
1	6920.7	3500.0	0.60	2.5					
2	6921.7	800.0	1.67	6.7	0.018	0.035	69.70	4.2739E14	2.44506E4
2	6921.7	3500.0	1.55	6.2	0.005	0.011	103.50	2.4043E15	3.57576E4
3	6922.6	800.0	1.59	6.4	0.009	0.021	107.29	5.3971E14	1.50872E4
3	6922.6	3500.0	1.42	5.8	0.002	0.006	120.61	4.0995E16	3.18779E5
4	6923.5	800.0	1.45	5.8	0.024	0.041	49.31	8.0695E13	5.95122E3
4	6923.5	3500.0	1.35	5.5	0.002	0.005	121.11	2.0215E15	1.27541E4
5	6925.0	800.0	1.18	7.2	0.023	0.038	47.20	4.7289E13	3.26655E3
5	6925.0	3500.0	0.92	5.6	0.002	0.005	143.17	7.5524E15	4.70184E4
6	6929.5	800.0	2.02	8.9	0.022	0.043	73.21	1.9725E13	1.39482E3
6	6929.5	3500.0	1.89	8.4	0.007	0.015	92.84	7.2080E14	1.65645E4
7	6930.5	800.0	2.52	10.1	0.018	0.037	80.86	1.0527E13	6.06347E2
7	6930.5	3500.0	2.42	9.8	0.007	0.015	72.62	5.5159E14	1.32367E4
8	6931.5	800.0	1.66	6.8	0.011	0.020	62.51	1.3993E14	4.72264E3
8	6931.5	3500.0	1.52	6.2	0.002	0.004	98.45	7.8834E15	4.31005E4
9	6932.5	800.0	2.37	9.4	0.014	0.032	98.08	8.3486E14	3.78057E4
9	6932.5	3500.0	2.28	9.0	0.009	0.019	88.23	2.1076E14	5.99321E3

CORE LABORATORIES

Company : CER Corporation/Fuelco
Well : FEE E-22-10-94-S

Field : Plateau Creek
Formation : As Noted

File No.: 57121-8512
Date : 12-Oct-1990

CMS - 300 TEST DATA

SAMPLE NUMBER	DEPTH ft	NOB PRESSURE psi	PORE VOLUME cc	POROSITY %	K∞ md	Kair(est) md	b (He) psi	BETA ft(-1)	ALPHA microns
10	6933.5	800.0	2.25	8.9	0.025	0.048	66.65	8.9951E14	7.20261E4
10	6933.5	3500.0	2.15	8.6	0.009	0.022	107.14	1.3684E14	3.96779E3
11	6934.5	800.0	2.26	9.5	0.169	0.275	39.00	6.2388E11	3.23371E2
11	6934.5	3500.0	2.13	9.0	0.033	0.071	70.26	5.4374E12	6.15567E2
12	6935.5	800.0	2.18	8.7	0.027	0.052	66.67	4.7940E14	4.16187E4
12	6935.5	3500.0	2.07	8.3	0.009	0.022	111.90	7.3682E13	2.11516E3
13	6936.5	800.0	2.27	9.0	0.026	0.054	74.49	2.5510E14	2.17096E4
13	6936.5	3500.0	2.15	8.6	0.010	0.024	109.75	1.2016E14	3.84622E3
14	6937.5	800.0	2.31	9.1	0.017	0.041	108.90	1.8993E14	1.03440E4
14	6937.5	3500.0	2.18	8.6	0.009	0.022	113.98	8.3573E13	2.38255E3
16	6939.5	800.0	2.59	10.4	0.039	0.079	72.03	1.1383E14	1.42260E4
16	6939.5	3500.0	2.46	9.9	0.014	0.036	102.18	1.2765E13	5.93167E2
17	6940.5	800.0	2.53	10.1	0.015	0.039	111.67	1.8715E14	9.31931E3
17	6940.5	3500.0	2.40	9.6	0.013	0.021	46.04	2.4362E15	1.04487E5
18	6941.5	800.0	1.65	10.8	0.024	0.053	84.92	5.8038E13	4.58714E3
18	6941.5	3500.0	1.40	9.4	0.012	0.032	122.27	3.7781E13	1.44435E3
19	6944.5	800.0	1.81	7.2	0.010	0.020	74.77	5.3994E12	1.82648E2
19	6944.5	3500.0	1.70	6.8	0.003	0.006	78.42		
20	6945.5	800.0	0.71	2.8	1.76	2.12	10.86	2.3997E10	1.32421E2
20	6945.5	3500.0	0.60	2.4	0.120	0.133	5.63	5.9084E12	2.48577E3

CORE LABORATORIES

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Field : Plateau Creek
Formation : As Noted

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Date : 12-Oct-1990

CMS - 300 TEST DATA

SAMPLE NUMBER	DEPTH ft	NOB PRESSURE psi	PORE VOLUME cc	POROSITY %	K∞ md	Kair(est) md	b (He) psi	BETA ft(-1)	ALPHA microns
21	6946.5	800.0	2.45	9.8	0.038	0.069	56.39	8.4794E13	9.98577E3
21	6946.5	3500.0	2.30	9.2	0.008	0.017	72.25	3.9839E14	1.04468E4
22	6947.5	800.0	2.32	9.3	0.011	0.028	125.92	2.0071E13	7.02697E2
22	6947.5	3500.0	2.19	8.8	0.005	0.011	80.35	9.0230E14	1.56629E4
23	6948.5	800.0	2.07	8.2	0.006	0.013	97.20	6.1087E15	1.15032E5
23	6948.5	3500.0	1.91	7.6	0.003	0.005	61.54		
24	6949.5	800.0	1.40	5.6	0.009	0.015	50.37	1.6652E13	4.86632E2
24	6949.5	3500.0	1.17	4.7	<.001	0.002	153.74		
25	6955.5	800.0	1.51	6.0	0.035	0.058	46.03	7.2700E13	8.34363E3
25	6955.5	3500.0	1.32	5.3	0.002	0.004	80.66		
26	6956.5	800.0	2.29	9.0	0.019	0.040	86.04	1.2140E15	7.36115E4
26	6956.5	3500.0	2.16	8.5	0.008	0.016	82.69	1.9651E15	4.77142E4
27	6957.5	800.0	2.41	9.5	0.019	0.045	99.02	3.7797E14	2.33210E4
27	6957.5	3500.0	2.25	8.9	0.009	0.019	88.79	1.3706E15	3.85616E4
28	7092.5	800.0	0.88	3.6	0.003	0.008	150.65		
28	7092.5	3500.0	0.47	1.9					
29	7094.0	800.0	0.68	2.7	0.004	0.009	139.60		
29	7094.0	3500.0	0.39	1.5					
30	7095.0	800.0	0.74	3.0	0.005	0.013	120.92		
30	7095.0	3500.0	0.44	1.8					

CORE LABORATORIES

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Field : Plateau Creek
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File No.: 57121-8512
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CMS - 300 TEST DATA

SAMPLE NUMBER	DEPTH ft	NOB PRESSURE psi	PORE VOLUME cc	POROSITY %	K∞ md	Kair(est) md	b (He) psi	BETA ft(-1)	ALPHA microns
31	7096.0	800.0	0.64	3.0	0.016	0.021	24.12	4.4480E13	2.21339E3
31	7096.0	3500.0	0.45	2.2					
32	7097.5	800.0	0.57	3.9	0.007	0.017	107.89		
32	7097.5	3500.0	0.25	1.8	<.001	<.001	531.42		
33	7110.5	800.0	0.70	2.9	<.001	0.003	243.38		
33	7110.5	3500.0	0.08	0.3					
34	7112.0	800.0	0.86	3.5	0.005	0.013	122.85		
34	7112.0	3500.0	0.59	2.4					
35	7116.0	800.0	0.85	3.6	0.006	0.015	116.08		
35	7116.0	3500.0	0.59	2.5					
36	7117.0	800.0	0.78	3.3	0.010	0.022	94.28		
36	7117.0	3500.0	0.58	2.5					
37	7118.0	800.0	0.64	4.2	0.019	0.024	20.74	2.7129E13	1.51292E3
37	7118.0	3500.0	0.42	2.8	<.001	0.001	102.57		
38	7120.0	800.0	1.09	4.4	0.008	0.014	60.05	1.5200E14	4.05738E3
38	7120.0	3500.0	0.85	3.5	<.001	0.002	165.89	2.2626E16	5.41528E4
39	7121.5	800.0	1.29	5.3	0.013	0.019	36.59	9.4262E13	4.02595E3
39	7121.5	3500.0	1.15	4.8	0.001	0.002	82.26		
41	7129.5	800.0	1.41	5.6	0.011	0.014	21.72	5.9554E13	2.10414E3
41	7129.5	3500.0	1.25	5.0	<.001	0.002	157.44		

CORE LABORATORIES

Company : CER Corporation/Fuelco
Well : FEE E-22-10-94-S

Field : Plateau Creek
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File No.: 57121-8512
Date : 12-Oct-1990

C M S - 3 0 0 T E S T D A T A

SAMPLE NUMBER	DEPTH ft	NOB PRESSURE psi	PORE VOLUME cc	POROSITY %	K∞ md	Kair(est) md	b (He) psi	BETA ft(-1)	ALPHA microns
42	7135.5	800.0	0.76	3.3	0.010	0.022	93.51		
42	7135.5	3500.0	0.59	2.5	<.001	0.001	433.91		
44	7143.5	800.0	1.77	6.9	0.010	0.014	40.31	2.0821E13	6.50497E2
44	7143.5	3500.0	1.63	6.4	0.002	0.003	30.77		
45	7148.5	800.0	0.99	3.9	0.009	0.021	96.85		
45	7148.5	3500.0	0.77	3.1	<.001	0.001	398.08		

CORE LABORATORIES

Company : CER Corporation/Fuelco
Well : FEE E-22-10-94-S

Field : Plateau Creek
Formation : As Noted

File No.: 57121-8512
Date : 12-Oct-1990

HANDLING & CLEANING

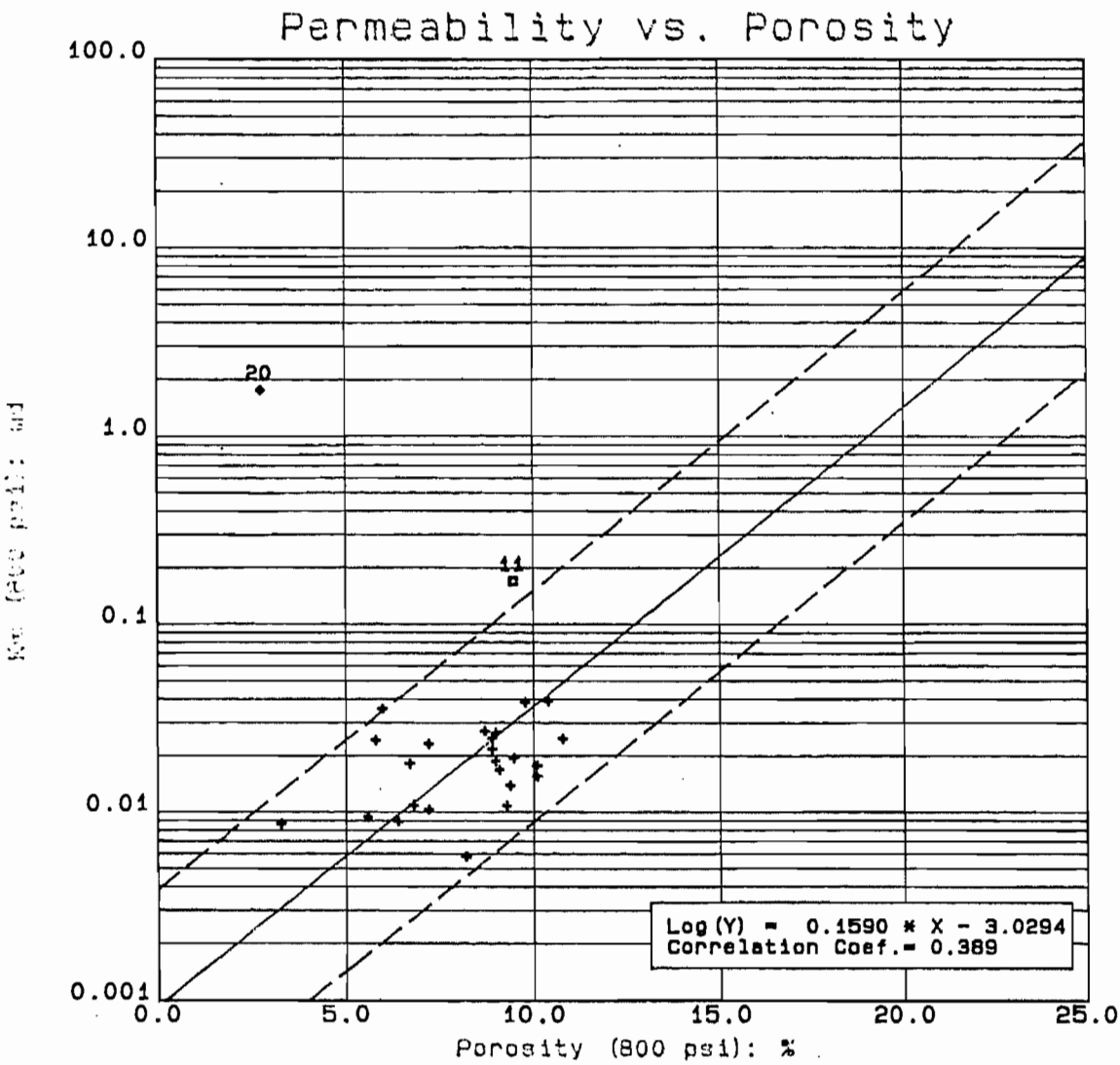
Core Transportation : Client Delivered to Aurora Facility
Solvent : Toluene
Extraction Equipment : Centrifuge
Extraction Time : No Extraction Required
Drying Equipment : Humidity Oven
Drying Time : 3 Days
Drying Temperature : 145 Degree Fahrenheit 45% Humidity

ANALYSIS

Grain volume measured by Boyle's Law in a matrix cup using He
Bulk volume measured by calipering
Bulk volume by Archimedes Principle
Permeabilities measured on one in. diameter drilled plugs
Core Gamma Composite

REMARKS

The core material will be sent to Sandia National Laboratories,
to the attention of Mr. John Lorenz.

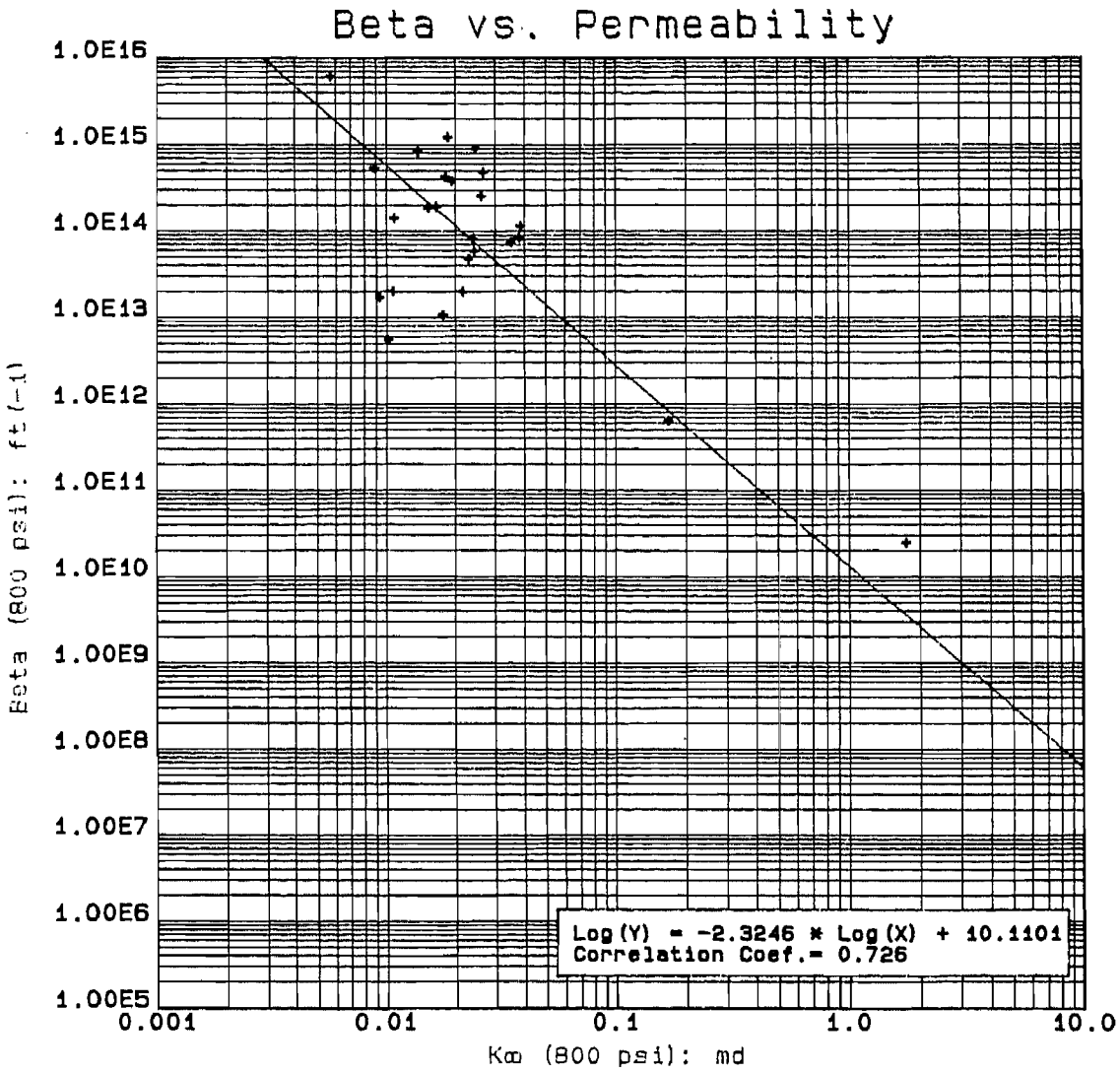


CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Cozzette Sandstone Formation
6904.0-6960.0 feet

Core Laboratories 12-Oct-1990

- LEGEND -
Cozzette

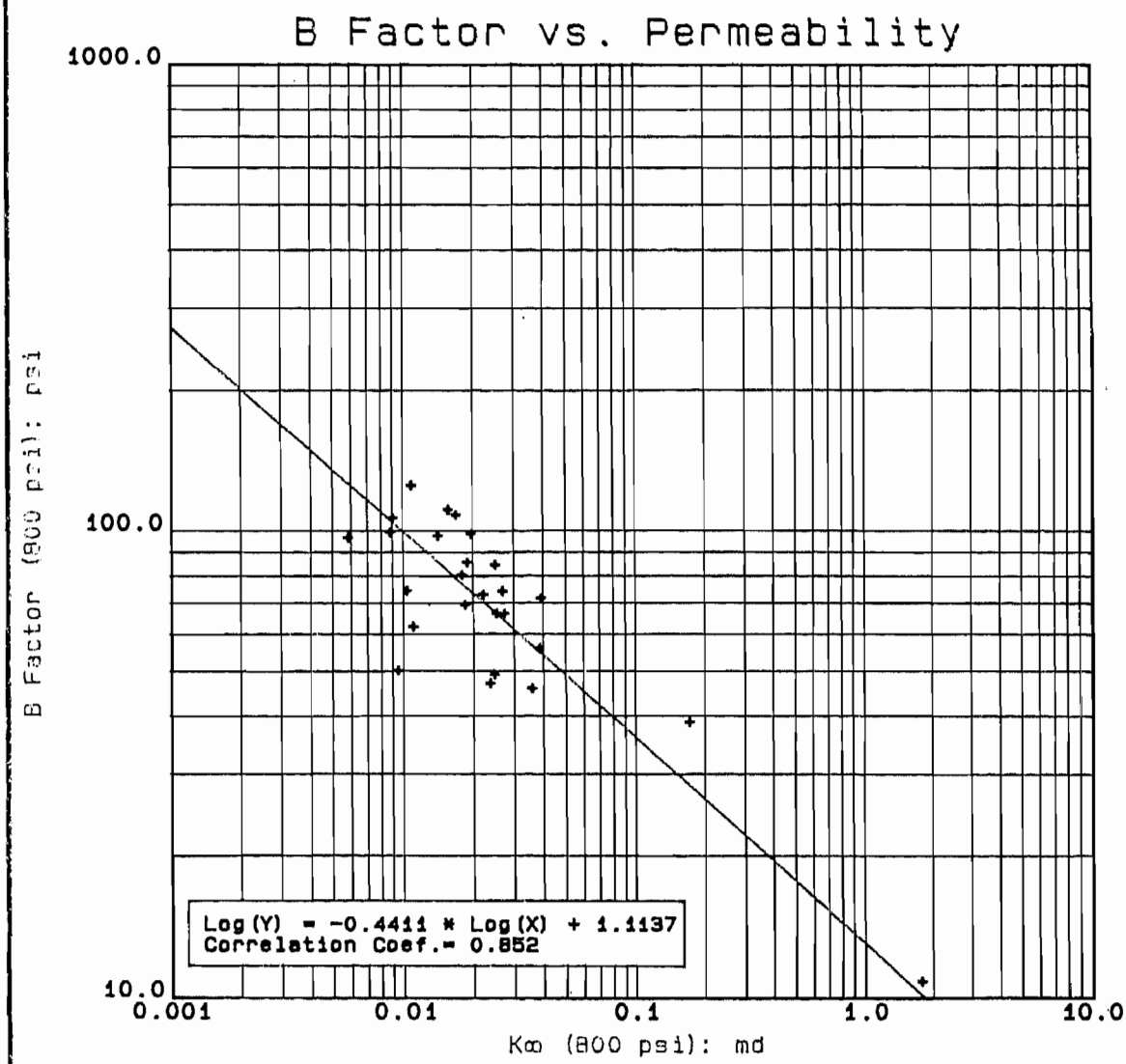
▫ Selected ◆ Deleted



CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Cozzette Sandstone Formation
6904.0-6960.0 feet

Core Laboratories 12-Oct-1990

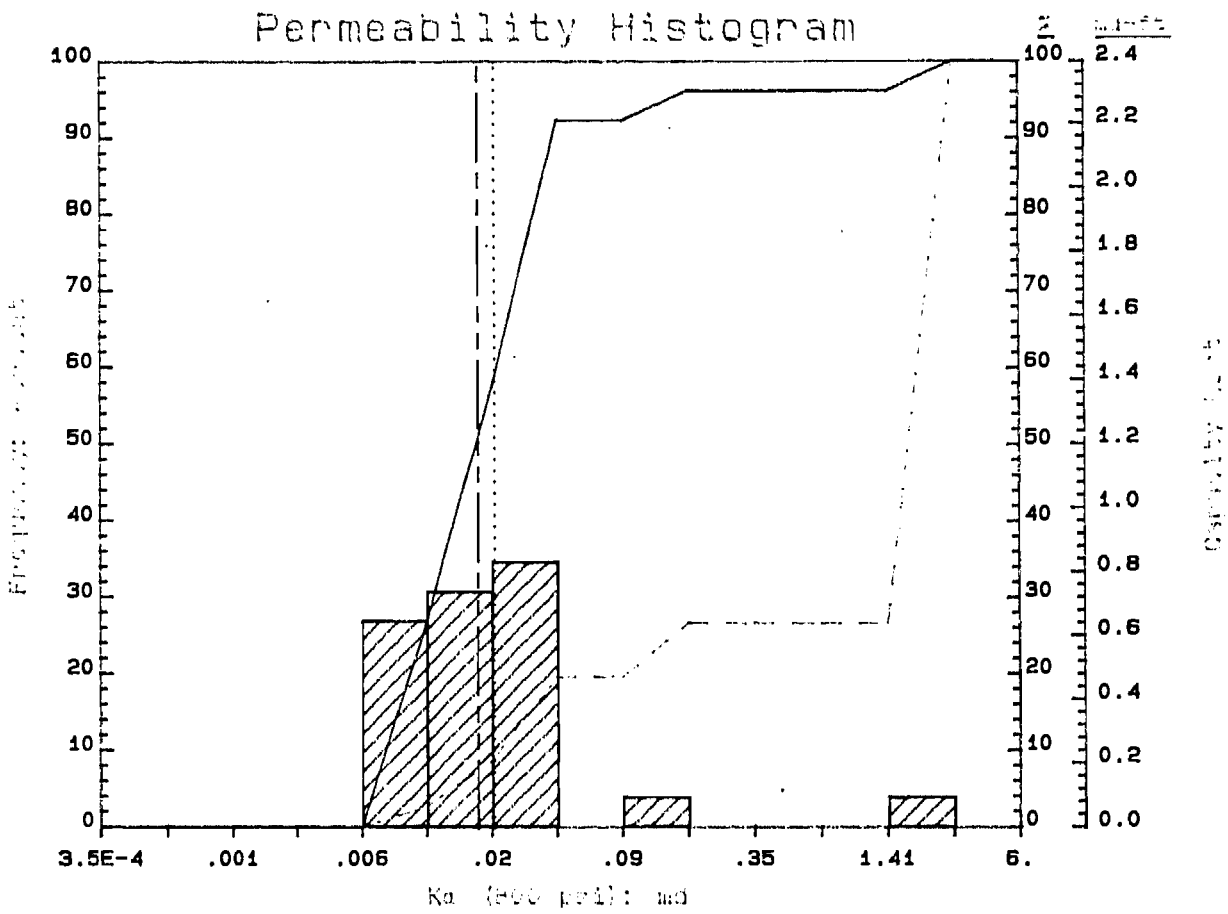
- LEGEND -
Cozzette



CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Cozzette Sandstone Formation
6904.0-6960.0 feet

Core Laboratories 12-Oct-1990

- LEGEND -
Cozzette



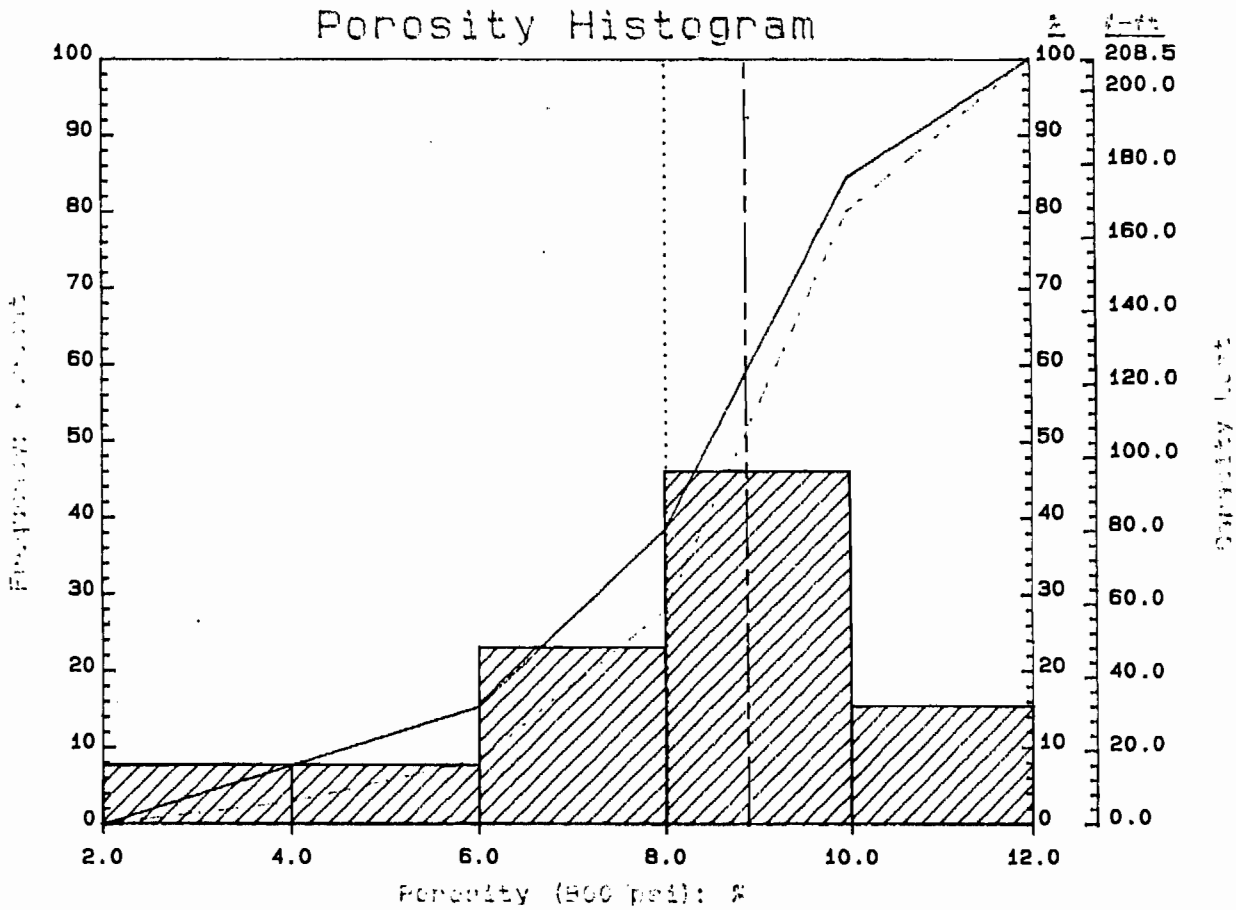
CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Cozzette Sandstone Formation
6904.0-6960.0 feet

Core Laboratories 12-Oct-1990

- LEGEND -

- Median Value (0.019)
- Geom. Average (0.023)
- Cumulative Frequency
- Cumulative Capacity Lost

26 Samples



CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Cozzette Sandstone Formation
6904.0-6960.0 feet

Core Laboratories 12-Oct-1990

- LEGEND -

——— - Median Value (8.9)
..... Arith. Average (8.0)
——— Cumulative Frequency
— — - Cumulative Capacity Lost

26 Samples

CORE LABORATORIES

Company : CER Corporation/Fuelco
Well : FEE E-22-10-94-S

Field : Plateau Creek
Formation : As Noted

File No.: 57121-8512
Date : 12-Oct-1990

TABLE II

SUMMARY OF CORE DATA

ZONE AND CUTOFF DATA

ZONE:

Identification --------	Corcoran
Top Depth ----------	7091.0 ft
Bottom Depth ----------	7149.0 ft
Number of Samples --------	18

DATA TYPE:

Porosity ----------	ϕ (800 psi)
Permeability ----------	K_∞ (800 psi)

CUTOFFS:

Porosity (Minimum) -------	0.0 %
Porosity (Maximum) -------	100.0 %
Permeability (Minimum) ---	0.0000 md
Permeability (Maximum) ---	100000. md
Water Saturation (Maximum)	
Oil Saturation (Minimum) -	
Grain Density (Minimum) --	2.00 gm/cc
Grain Density (Maximum) --	3.00 gm/cc
Lithology Excluded -------	NONE

CHARACTERISTICS REMAINING AFTER CUTOFFS

ZONE:

Number of Samples -----	16
Thickness Represented -	16.0 ft

POROSITY:

Storage Capacity ------	63.1 ϕ-ft
Arithmetic Average ----	3.9 %
Minimum ----------	2.7 %
Maximum ----------	6.9 %
Median ----------	3.6 %
Standard Deviation ----	±1.1 %

GRAIN DENSITY:

Arithmetic Average ----	2.70 gm/cc
Minimum ----------	2.68 gm/cc
Maximum ----------	2.72 gm/cc
Median ----------	2.70 gm/cc
Standard Deviation ----	±0.01 gm/cc

PERMEABILITY:

Flow Capacity ---------	0.1 md-ft
Arithmetic Average ----	0.009 md
Geometric Average -----	0.007 md
Harmonic Average ------	0.004 md
Minimum ----------	0.001 md
Maximum ----------	0.019 md
Median ----------	0.009 md
Standard Dev. (Geom) --	$K \cdot 10^{\pm 0.372}$ md

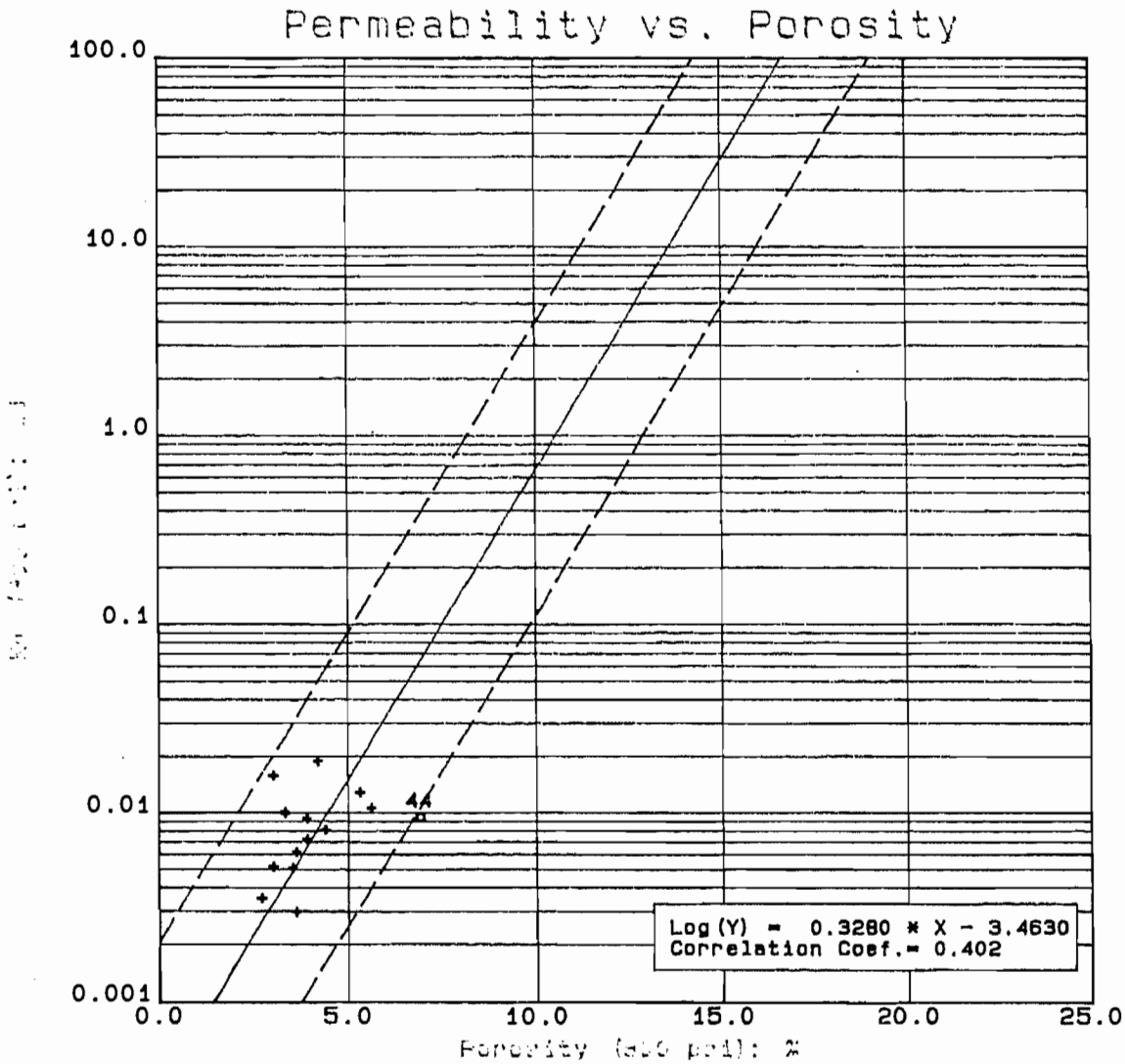
HETEROGENEITY (Permeability):

Dykstra-Parsons Var. --	0.404
Lorenz Coefficient ----	0.257

AVERAGE SATURATIONS (Pore Volume):

Oil ----------	
Water ----------	

** Permeabilities less than 0.001 or greater than 3000 md exceed current CMS capabilities. Values exceeding **
** limits are assigned permeabilities of 0.0005 and 3500 md respectively for statistical and graphical purposes. **

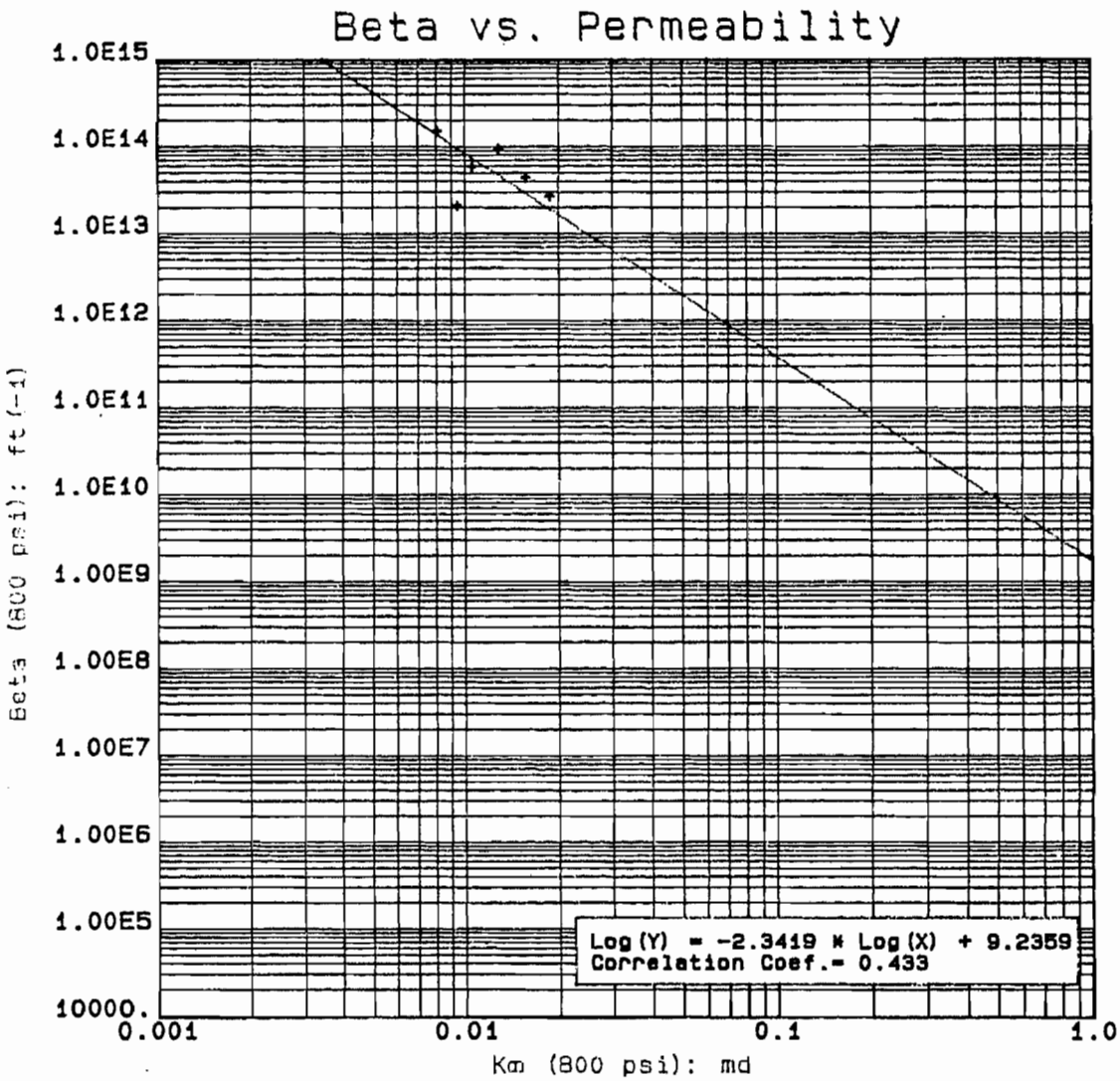


CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Corcoran Sandstone Formation
7092.0-7150.4 feet

Core Laboratories 12-Oct-1990

- LEGEND -
Corcoran

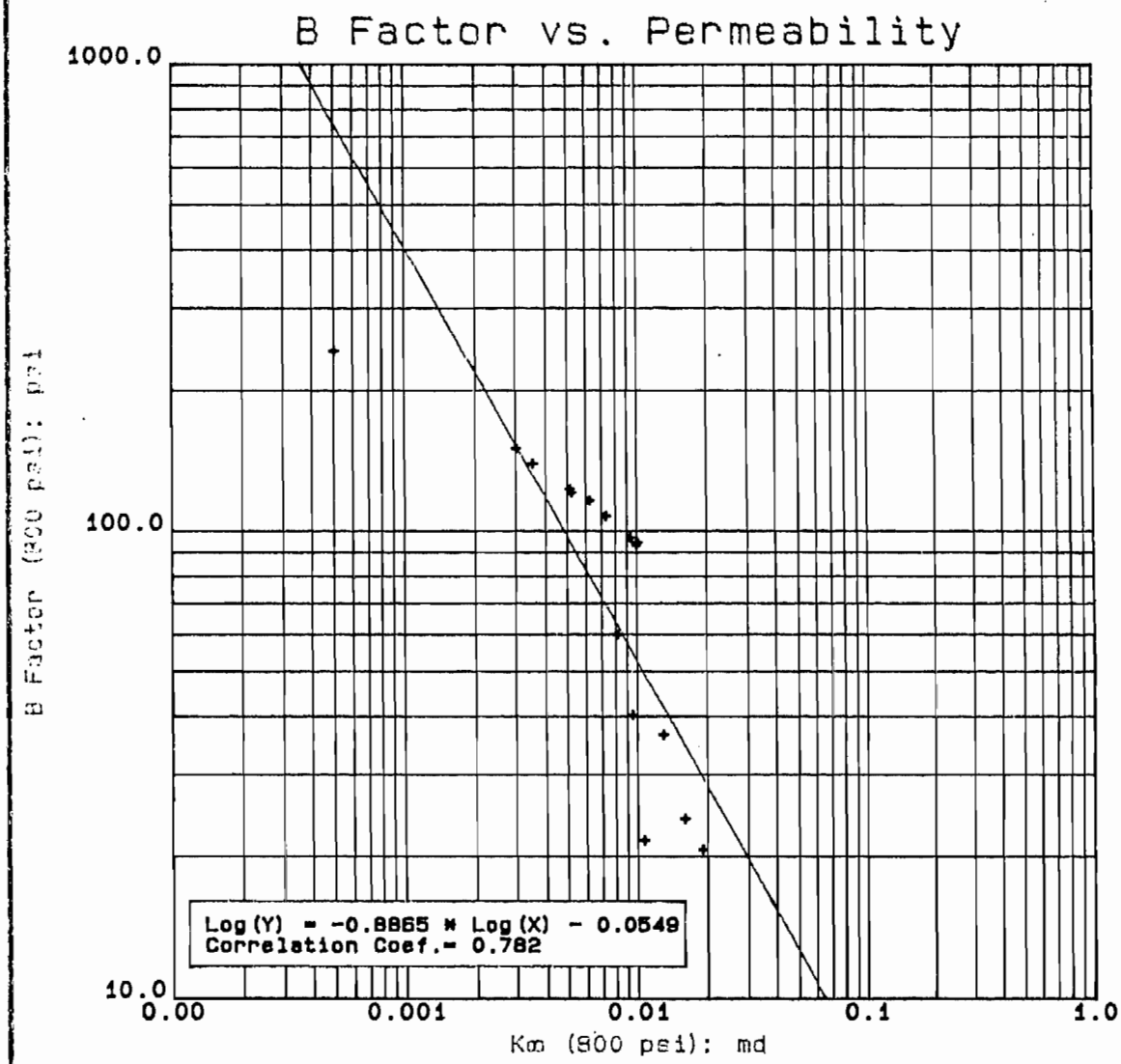
▫ Selected



CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Corcoran Sandstone Formation
7092.0-7150.4 feet

Core Laboratories 12-Oct-1990

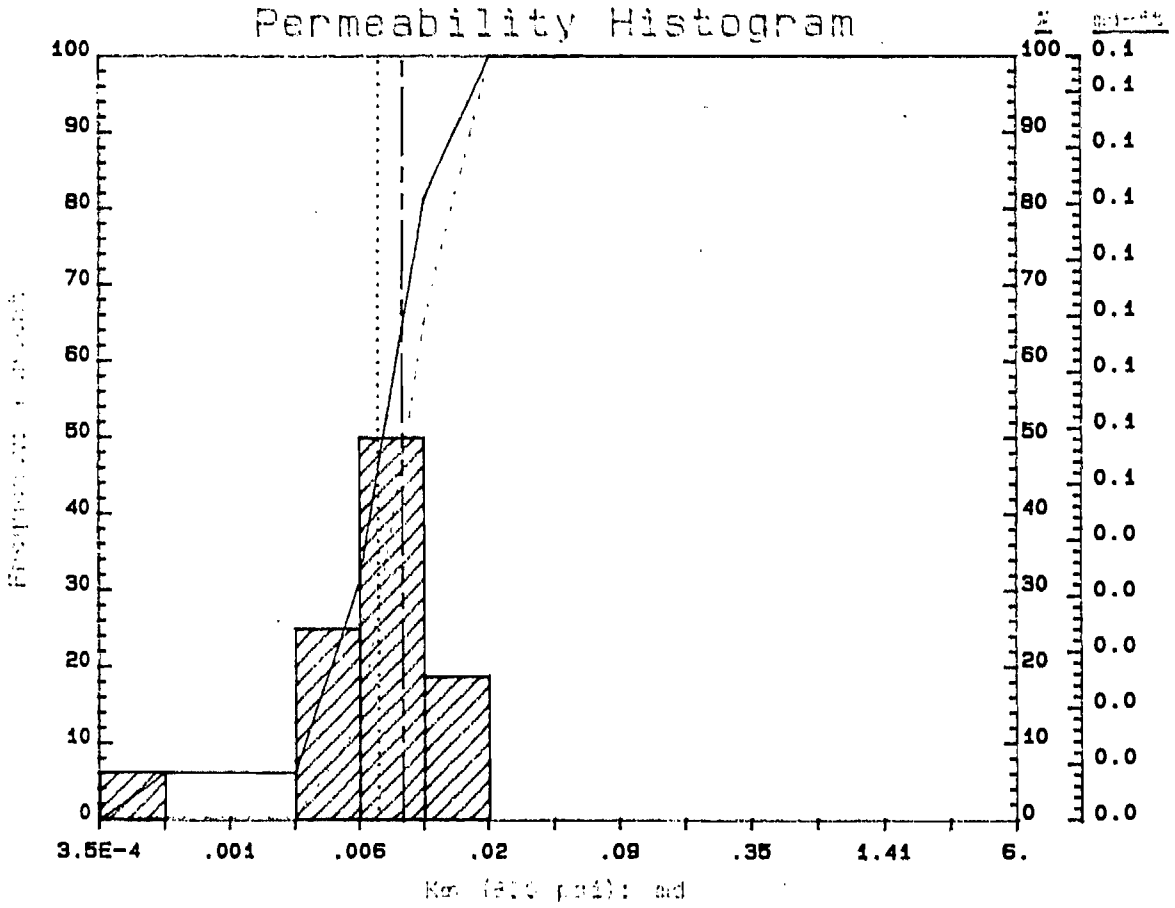
- LEGEND -
Corcoran



CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Corcoran Sandstone Formation
7092.0-7150.4 feet

Core Laboratories 12-Oct-1990

- LEGEND -
Corcoran



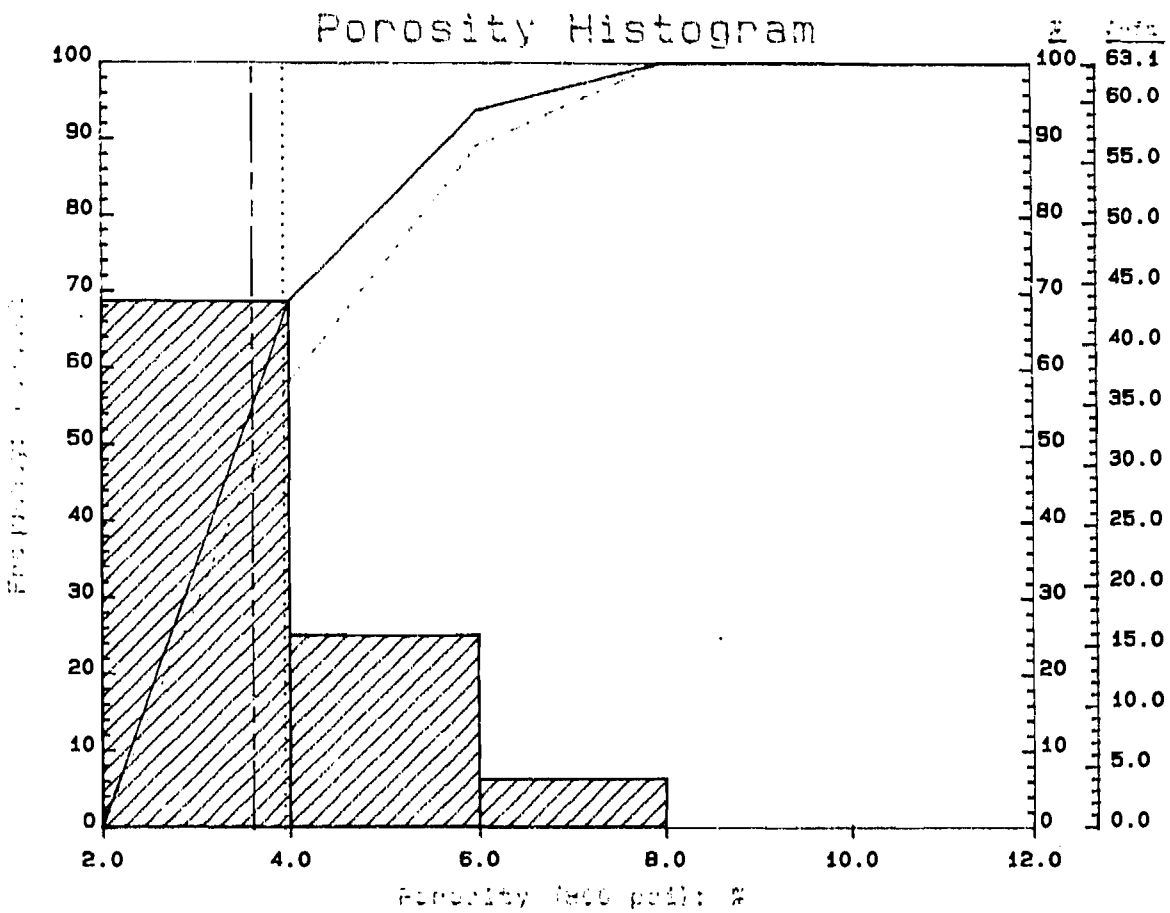
CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Corcoran Sandstone Formation
7092.0-7150.4 feet

Core Laboratories 12-Oct-1990

- LEGEND -

- Median Value (0.009)
- Geom. Average (0.007)
- Cumulative Frequency
- Cumulative Capacity Lost

16 Samples



CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Corcoran Sandstone Formation
7092.0-7150.4 feet

Core Laboratories 12-Oct-1990

- LEGEND -

——— Median Value (3.6)
..... Arith. Average (3.9)
——— Cumulative Frequency
— — — Cumulative Capacity Lost

16 Samples

SECTION II

CMS-300 PLUG DATA

3500 PSI OVERBURDEN PRESSURE

CORE LABORATORIES

Company : CER Corporation/Fuelco
Well : FEE E-22-10-94-S
Location : Sec. 22 T10S R94W
Co,State : Mesa, Colorado

Field : Plateau Creek
Formation : As Noted
Coring Fluid : Water Base Mud
Elevation :

File No.: 57121-8512
Date : 12-Oct-1990
API No. :
Analysts: PD DW MW RR

CORE ANALYSIS RESULTS

(HYDROSTATIC CONFINEMENT)

SAMPLE NUMBER	DEPTH ft	NET OVERBURDEN (3500 psi) K∞ md	Kair md	φ %	POROSITY (HELIUM) %	GRAIN DENSITY gm/cc	DESCRIPTION
		Core No. 1	Cozzette Sandstone		6904.0'-6960.0'	Cut 56.0' Rec. 56.0'	
1	6920.7			2.5	3.1	2.77	Sst dk gry vf-f gr carb arg abdnt pyr
2	6921.7	0.005	0.011	6.2	6.8	2.71	Sst gry vf-f gr arg bioturb pyr
3	6922.6	0.002	0.006	5.8	6.7	2.70	Sst gry vf-f gr arg bioturb pyr
4	6923.5	0.002	0.005	5.5	6.2	2.73	Sst gry vf-f gr arg bioturb pyr
5	6925.0	0.002	0.005	5.6	6.4	2.70	Sst gry vf-f gr arg bioturb pyr
6	6929.5	0.007	0.015	8.4	9.5	2.67	Sst lt gry vf gr arg
7	6930.5	0.007	0.015	9.8	10.2	2.71	Sst lt gry vf gr arg
8	6931.5	0.002	0.004	6.2	6.6	2.72	Sst lt gry vf gr arg bioturb
9	6932.5	0.009	0.019	9.0	9.3	2.70	Sst lt gry vf gr arg
10	6933.5	0.009	0.022	8.6	9.0	2.68	Sst lt gry vf gr arg
11	6934.5	0.033	0.071	9.0	9.5	2.69	Sst lt gry vf gr arg
12	6935.5	0.009	0.022	8.3	9.0	2.69	Sst lt gry vf gr arg
13	6936.5	0.010	0.024	8.6	9.1	2.70	Sst lt gry vf gr arg
14	6937.5	0.009	0.022	8.6	9.2	2.71	Sst lt gry vf gr arg
+ 15	6938.5				10.3	2.71	Sst lt gry vf gr arg
16	6939.5	0.014	0.036	9.9	10.7	2.70	Sst lt gry vf gr arg
17	6940.5	0.013	0.021	9.6	10.4	2.71	Sst lt gry vf gr arg
18	6941.5	0.012	0.032	9.4	9.5	2.71	Sst lt gry vf gr arg
19	6944.5	0.003	0.006	6.8	7.3	2.71	Sst gry vf gr arg sh lam
20	6945.5	0.120	0.133	2.4	3.9	2.67	Sst gry vf gr arg sh lam
21	6946.5	0.008	0.017	9.2	9.8	2.69	Sst lt gry vf gr arg
22	6947.5	0.005	0.011	8.8	9.4	2.69	Sst lt gry vf gr arg

CORE LABORATORIES

Company : CER Corporation/Fuelco
Well : FEE E-22-10-94-S

Field : Plateau Creek
Formation : As Noted

File No.: 57121-8512
Date : 12-Oct-1990

CORE ANALYSIS RESULTS

(HYDROSTATIC CONFINEMENT)

SAMPLE NUMBER	DEPTH ft	NET OVERBURDEN (3500 psi) K∞ md	Kair md	φ %	POROSITY (HELIUM) %	GRAIN DENSITY gm/cc	DESCRIPTION
23	6948.5	0.003	0.005	7.6	8.2	2.69	Sst lt gry vf gr arg bioturb
24	6949.5	<.001	0.002	4.7	5.4	2.68	Sst lt gry vf gr arg bioturb sh lam
25	6955.5	0.002	0.004	5.3	6.3	2.69	Sst lt gry vf gr arg sh lam
26	6956.5	0.008	0.016	8.5	9.0	2.68	Sst lt gry vf gr arg
27	6957.5	0.009	0.019	8.9	9.4	2.69	Sst lt gry vf gr arg
		Core No. 2	Corcoran Sandstone 7092.0'-7150.4'				Cut 58.4' Rec. 58.4'
28	7092.5			1.9	3.2	2.68	Sst dk gry vf gr arg carb
29	7094.0			1.5	2.8	2.70	Sst dk gry vf gr arg carb bioturb
30	7095.0			1.8	2.9	2.69	Sltst dk gry arg sh sli sst
31	7096.0			2.2	3.1	2.69	Sltst dk gry arg sh sli sst
32	7097.5	<.001	<.001	1.8	2.9	2.70	Sst dk gry vf gr arg sh
33	7110.5			0.3	3.0	2.70	Sst dk gry vf gr arg sh
34	7112.0			2.4	3.3	2.72	Sst dk gry vf gr arg sh
35	7116.0			2.5	3.5	2.72	Sst gry vf gr arg sh
36	7117.0			2.5	3.4	2.71	Sst gry vf gr arg sh
37	7118.0	<.001	0.001	2.8	3.5	2.72	Sst gry vf gr arg sh
38	7120.0	<.001	0.002	3.5	4.4	2.70	Sst gry vf gr arg
39	7121.5	0.001	0.002	4.8	5.4	2.70	Sst gry vf gr arg
+ 40	7126.0				5.0	2.71	Sst gry vf gr arg
41	7129.5	<.001	0.002	5.0	5.4	2.71	Sst gry vf gr arg
42	7135.5	<.001	0.001	2.5	3.0	2.70	Sst gry vf gr arg sh
+ 43	7139.5				4.3	2.69	Sst gry vf gr arg
44	7143.5	0.002	0.003	6.4	6.9	2.70	Sst gry vf gr arg
45	7148.5	<.001	0.001	3.1	3.9	2.71	Sst gry vf gr arg sh

CORE LABORATORIES

Company : CER Corporation/Fuelco
Well : FEE E-22-10-94-S

Field : Plateau Creek
Formation : As Noted

File No.: 57121-8512
Date : 12-Oct-1990

CORE ANALYSIS RESULTS

(HYDROSTATIC CONFINEMENT)

SAMPLE NUMBER	DEPTH	NET OVERBURDEN (3500 psi)			POROSITY (HELIUM)	GRAIN DENSITY	DESCRIPTION
		K∞	Kair	ϕ			
	ft	md	md	%	%	gm/cc	

+ Denotes Sample Unsuitable For CMS-300 Measurements

CORE LABORATORIES

Company : CER Corporation/Fuelco
Well : FEE E-22-10-94-S

Field : Plateau Creek
Formation : As Noted

File No.: 57121-8512
Date : 12-Oct-1990

TABLE I

SUMMARY OF CORE DATA

ZONE AND CUTOFF DATA

ZONE:

Identification --------	Cozzette
Top Depth ----------	6919.0 ft
Bottom Depth ----------	6958.0 ft
Number of Samples --------	27

DATA TYPE:

Porosity ----------	ϕ (3500 psi)
Permeability ----------	K_∞ (3500 psi)

CUTOFFS:

Porosity (Minimum) -------	0.0 %
Porosity (Maximum) -------	100.0 %
Permeability (Minimum) ---	0.0000 md
Permeability (Maximum) ---	100000. md
Water Saturation (Maximum)	
Oil Saturation (Minimum) -	
Grain Density (Minimum) --	2.00 gm/cc
Grain Density (Maximum) --	3.00 gm/cc
Lithology Excluded -------	NONE

CHARACTERISTICS REMAINING AFTER CUTOFFS

ZONE:

Number of Samples -----	25
Thickness Represented --	25.0 ft

POROSITY:

Storage Capacity ------	190.7 ϕ-ft
Arithmetic Average ----	7.6 %
Minimum ----------	2.4 %
Maximum ----------	9.9 %
Median ----------	8.5 %
Standard Deviation ----	±1.9 %

GRAIN DENSITY:

Arithmetic Average ----	2.70 gm/cc
Minimum ----------	2.67 gm/cc
Maximum ----------	2.73 gm/cc
Median ----------	2.70 gm/cc
Standard Deviation ----	±0.01 gm/cc

PERMEABILITY:

Flow Capacity ---------	0.3 md-ft
Arithmetic Average ----	0.012 md
Geometric Average -----	0.006 md
Harmonic Average ------	0.003 md
Minimum ----------	0.001 md
Maximum ----------	0.120 md
Median ----------	0.008 md
Standard Dev. (Geom) --	$K \cdot 10^{\pm 0.476}$ md

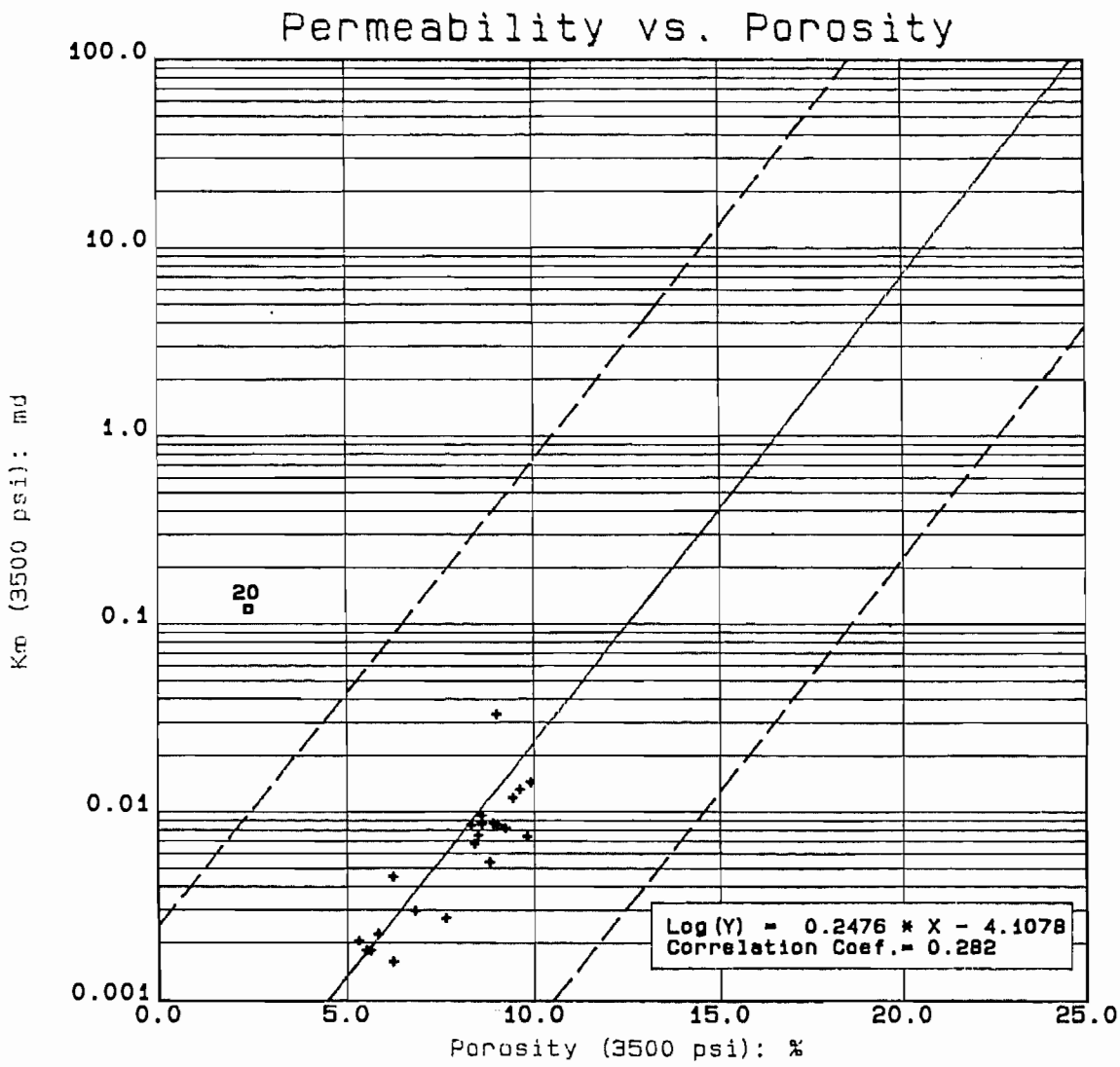
HETEROGENEITY (Permeability):

Dykstra-Parsons Var. --	0.394
Lorenz Coefficient ----	0.583

AVERAGE SATURATIONS (Pore Volume):

Oil ----------	
Water ----------	

** Permeabilities less than 0.001 or greater than 3000 md exceed current CMS capabilities. Values exceeding **
** limits are assigned permeabilities of 0.0005 and 3500 md respectively for statistical and graphical purposes. **

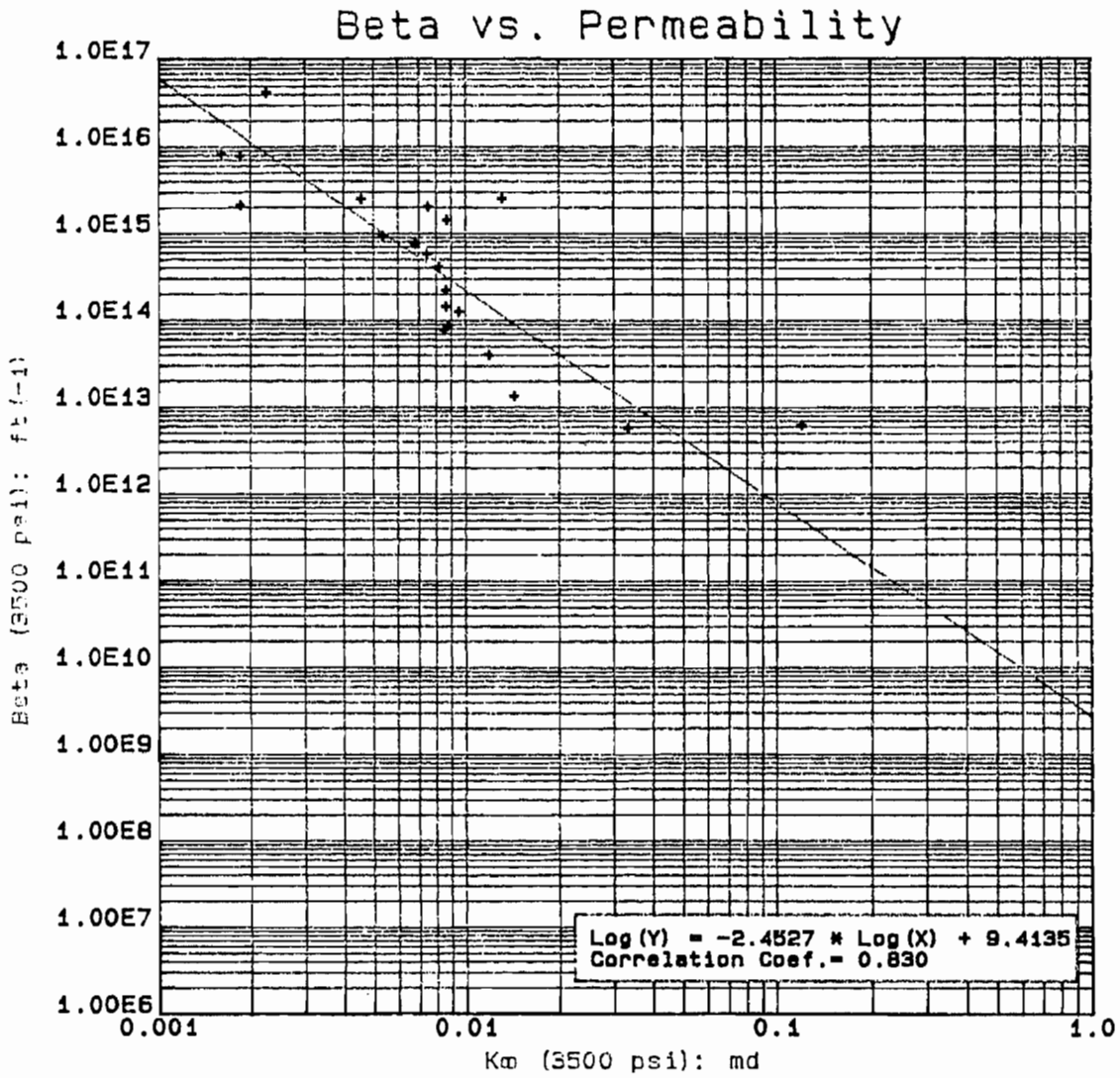


CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Cozzette Sandstone Formation
6904.0-6960.0 feet

Core Laboratories 12-Oct-1990

- LEGEND -
Cozzette

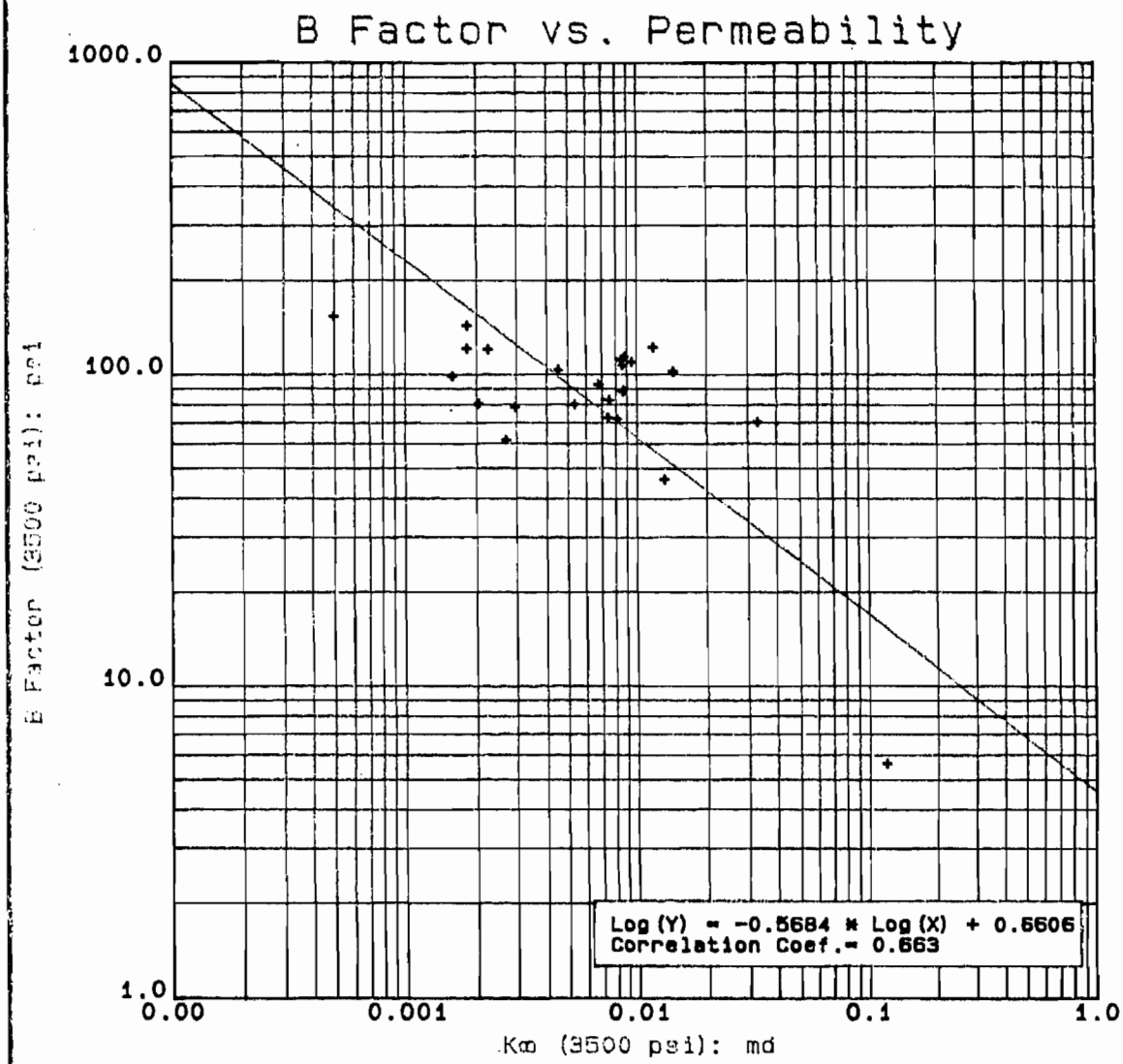
▫ Selected



CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Cozzette Sandstone Formation
6904.0-6960.0 feet

Core Laboratories 12-Oct-1990

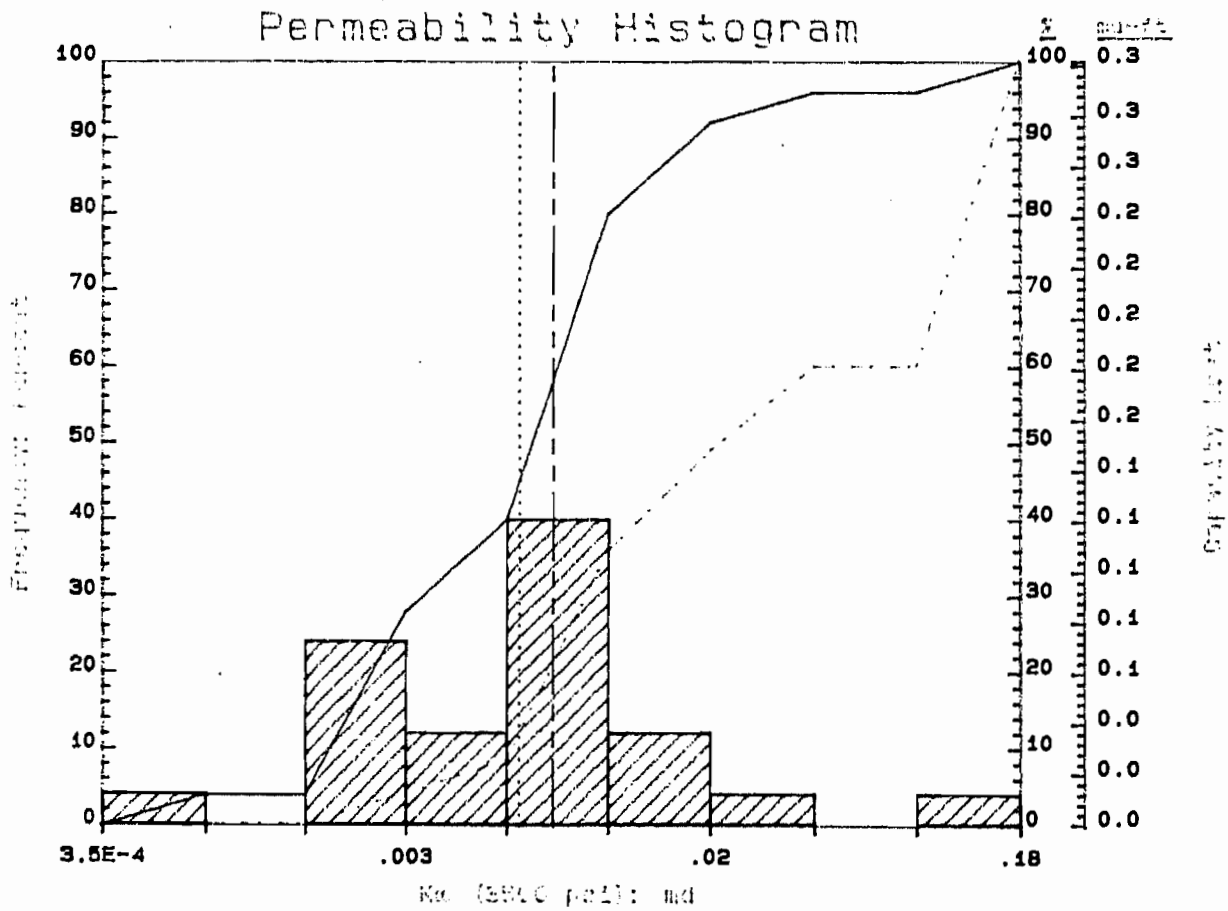
- LEGEND -
Cozzette



CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Cozzette Sandstone Formation
6904.0-6960.0 feet

Core Laboratories 12-Oct-1990

- LEGEND -
Cozzette



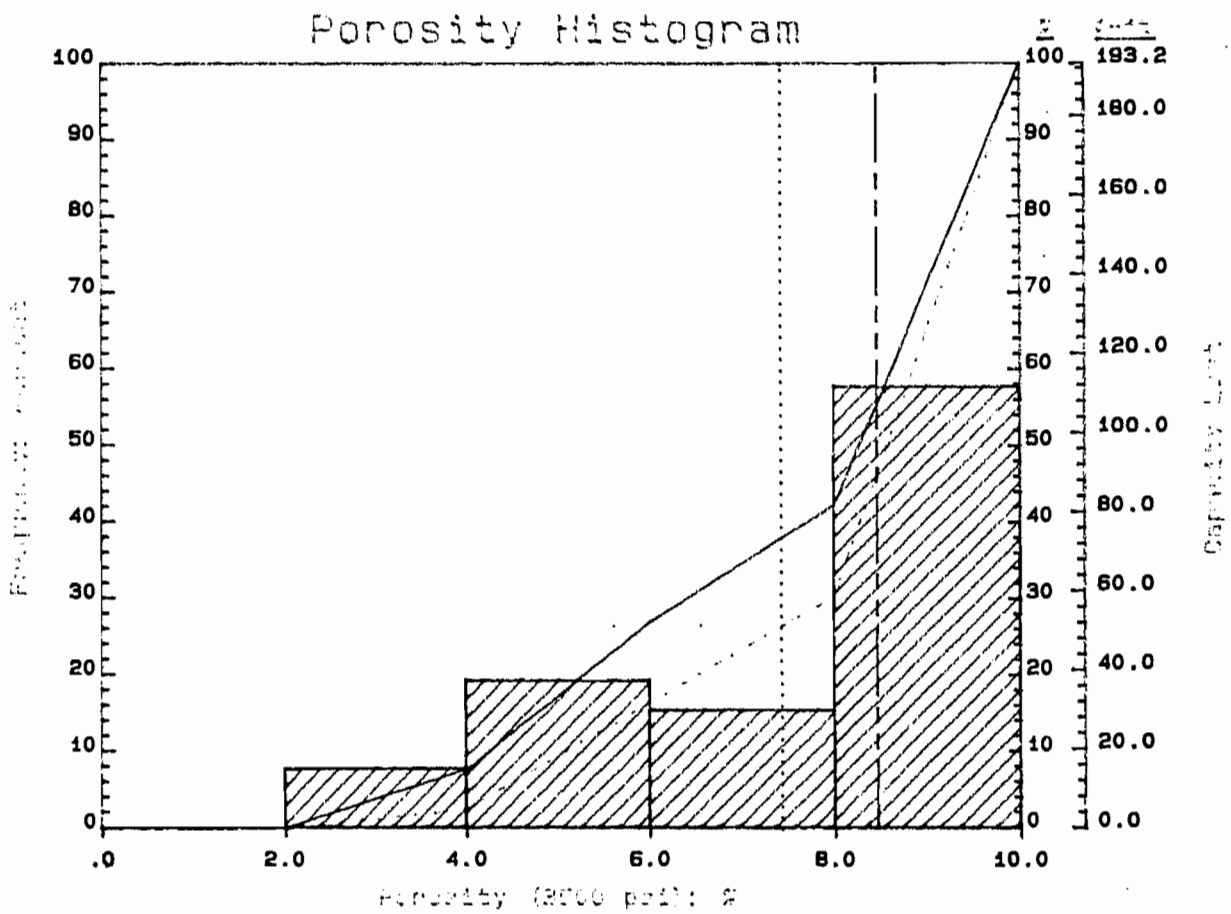
CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Cozzette Sandstone Formation
6904.0-6960.0 feet

Core Laboratories 12-Oct-1990

- LEGEND -

- Median Value (0.008)
- Geom. Average (0.006)
- Cumulative Frequency
- Cumulative Capacity Lost

25 Samples



CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Cozzette Sandstone Formation
6904.0-6960.0 feet

Core Laboratories 12-Oct-1990

- LEGEND -

- Median Value (8.4)
- Arith. Average (7.4)
- Cumulative Frequency
- Cumulative Capacity Lost

26 Samples

CORE LABORATORIES

Company : CER Corporation/Fuelco
Well : FEE E-22-10-94-S

Field : Plateau Creek
Formation : As Noted

File No.: 57121-8512
Date : 12-Oct-1990

TABLE II

SUMMARY OF CORE DATA

ZONE AND CUTOFF DATA

ZONE:

Identification --------	Corcoran
Top Depth ----------	7091.0 ft
Bottom Depth ----------	7149.0 ft
Number of Samples --------	18

DATA TYPE:

Porosity ----------	ϕ (3500 psi)
Permeability ----------	K_∞ (3500 psi)

CUTOFFS:

Porosity (Minimum) -------	0.0 %
Porosity (Maximum) -------	100.0 %
Permeability (Minimum) ---	0.0000 md
Permeability (Maximum) ---	100000. md
Water Saturation (Maximum)	
Oil Saturation (Minimum) -	
Grain Density (Minimum) --	2.00 gm/cc
Grain Density (Maximum) --	3.00 gm/cc
Lithology Excluded -------	NONE

CHARACTERISTICS REMAINING AFTER CUTOFFS

ZONE:

Number of Samples -----	8
Thickness Represented -	8.0 ft

POROSITY:

Storage Capacity ------	29.9 ϕ-ft
Arithmetic Average ----	3.7 %
Minimum ----------	1.8 %
Maximum ----------	6.4 %
Median ----------	3.3 %
Standard Deviation ----	±1.5 %

GRAIN DENSITY:

Arithmetic Average ----	2.70 gm/cc
Minimum ----------	2.70 gm/cc
Maximum ----------	2.72 gm/cc
Median ----------	2.70 gm/cc
Standard Deviation ----	±0.01 gm/cc

PERMEABILITY:

Flow Capacity ---------	0.0 md-ft
Arithmetic Average ----	0.001 md
Geometric Average -----	0.001 md
Harmonic Average ------	0.001 md
Minimum ----------	0.001 md
Maximum ----------	0.002 md
Median ----------	0.001 md
Standard Dev. (Geom) --	$K \cdot 10^{\pm 0.238}$ md

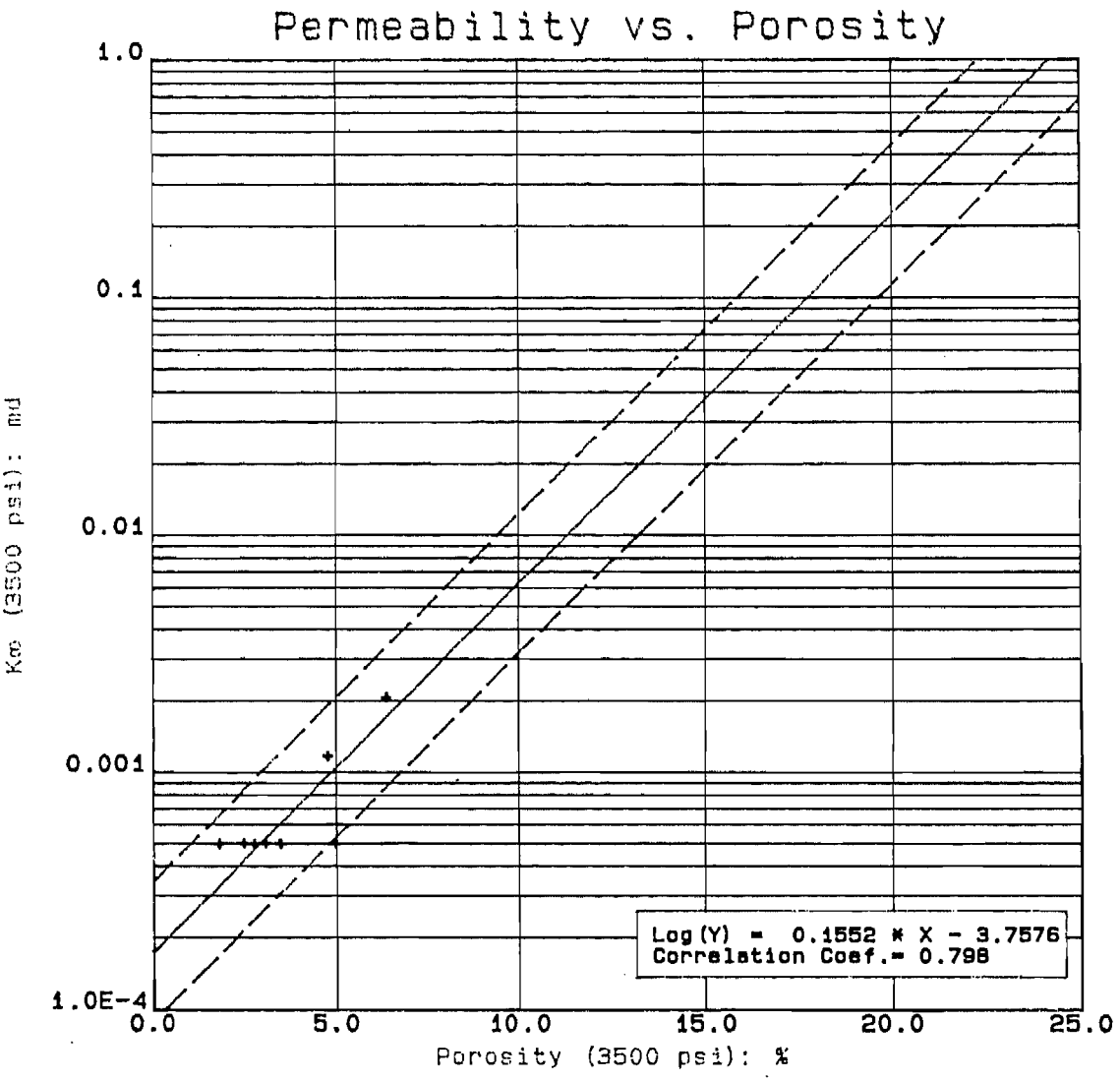
HETEROGENEITY (Permeability):

Dykstra-Parsons Var. --	-0.000
Lorenz Coefficient ----	0.135

AVERAGE SATURATIONS (Pore Volume):

Oil ----------	
Water ----------	

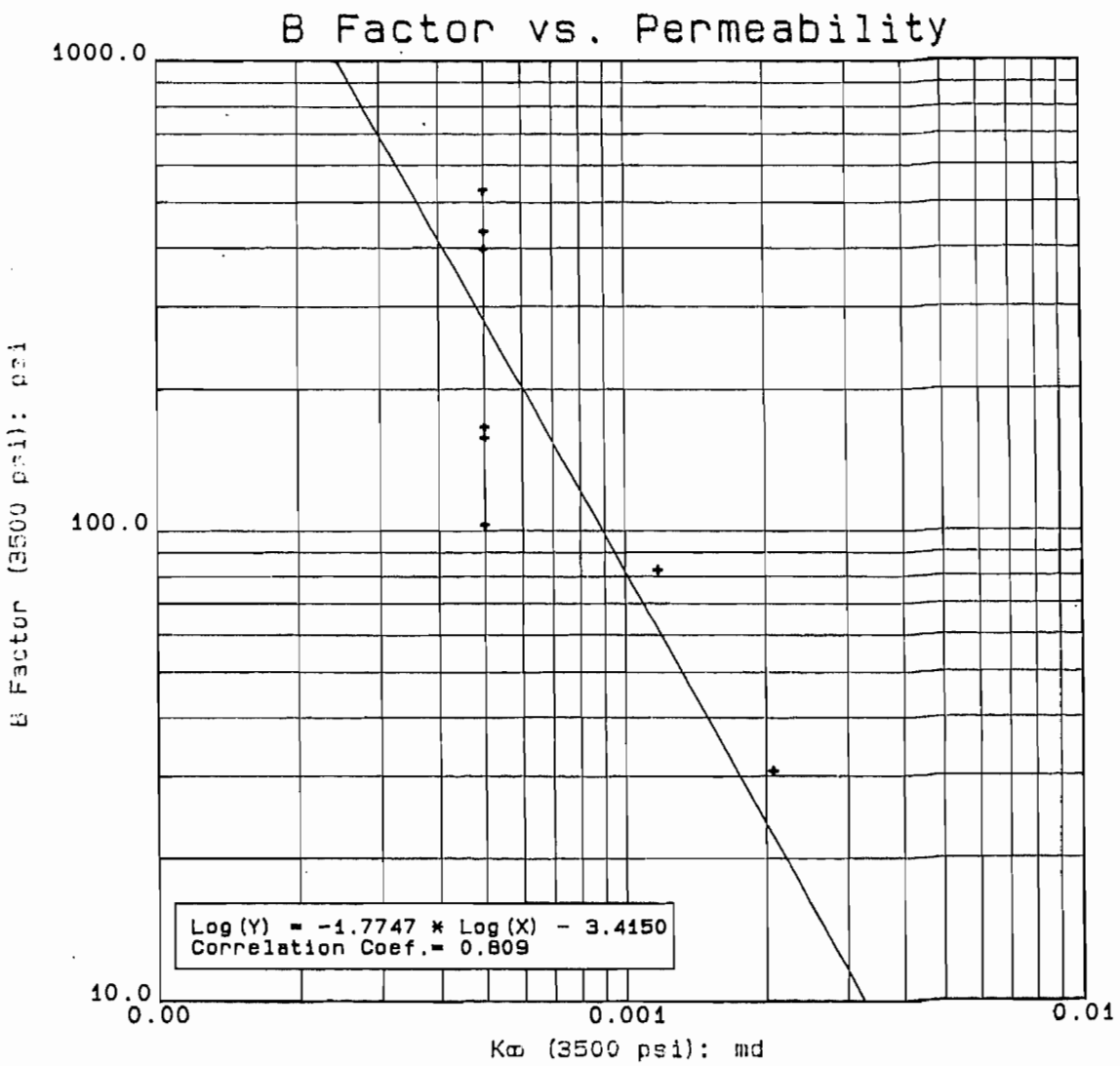
** Permeabilities less than 0.001 or greater than 3000 md exceed current CMS capabilities. Values exceeding **
** limits are assigned permeabilities of 0.0005 and 3500 md respectively for statistical and graphical purposes. **



CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Corcoran Sandstone Formation
7092.0-7150.4 feet

Core Laboratories 12-Oct-1990

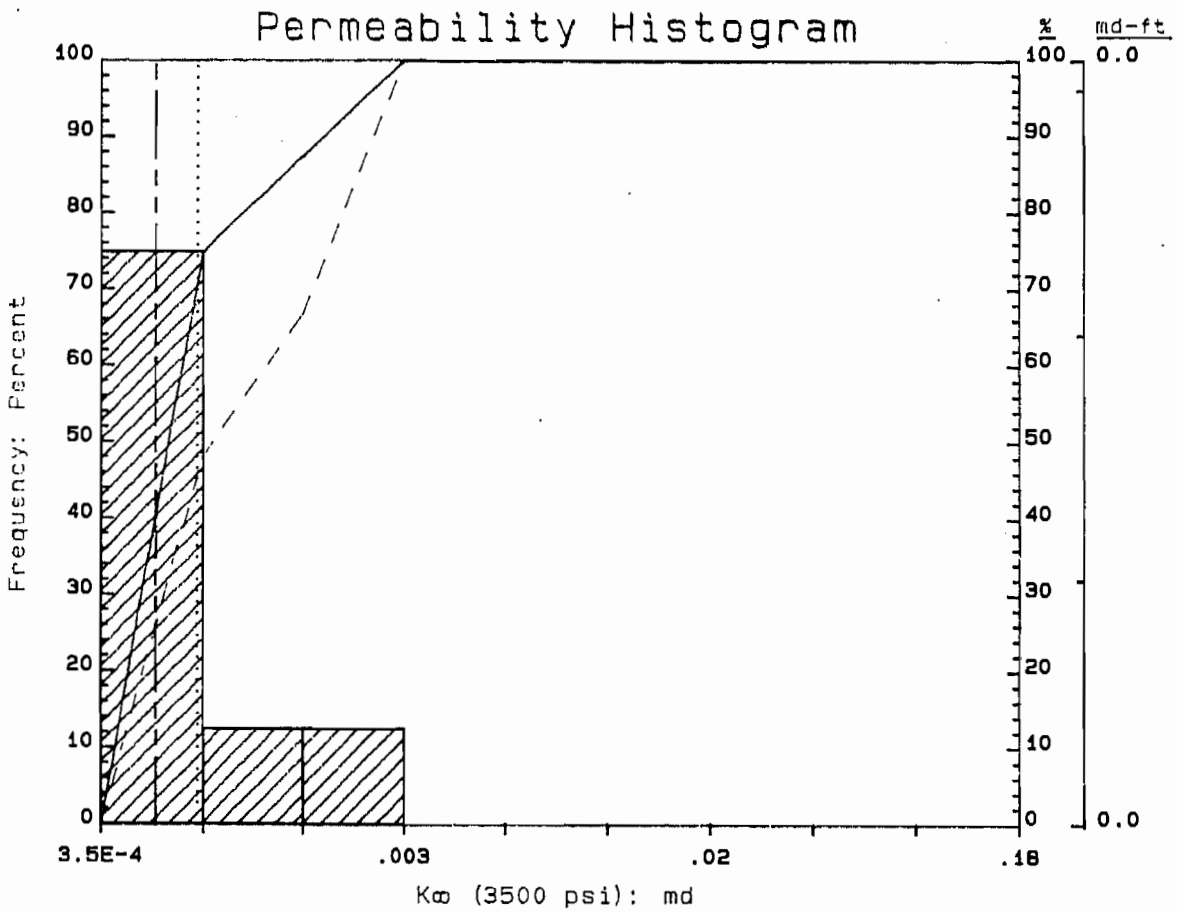
- LEGEND -
Corcoran



CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Corcoran Sandstone Formation
7092.0-7150.4 feet

Core Laboratories 12-Oct-1990

- LEGEND -
Corcoran

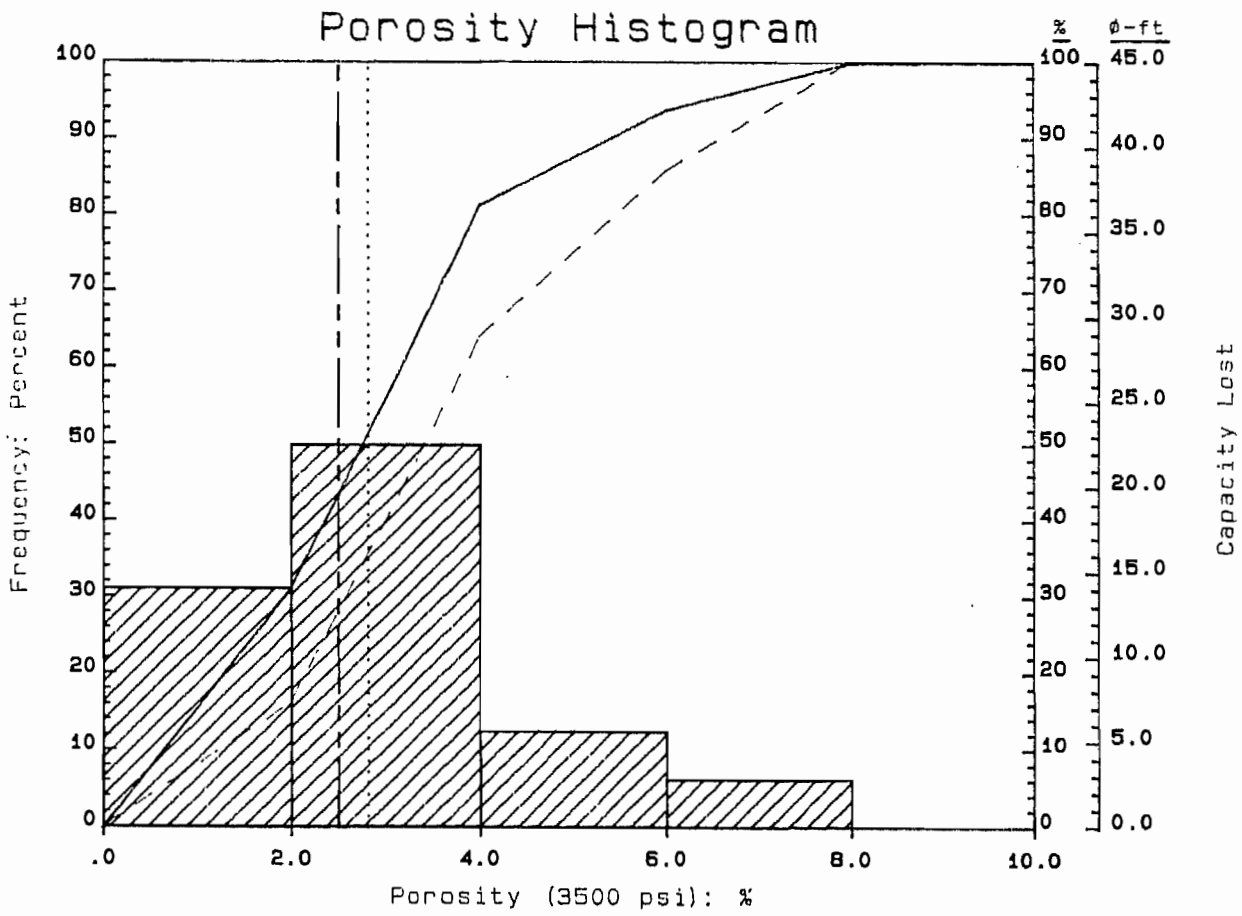


CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Corcoran Sandstone Formation
7092.0-7150.4 feet
Core Laboratories 12-Oct-1990

- LEGEND -

——— - Median Value (0.001)
..... Geom. Average (0.001)
——— Cumulative Frequency
— — - Cumulative Capacity Lost

8 Samples



CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Corcoran Sandstone Formation
7092.0-7150.4 feet

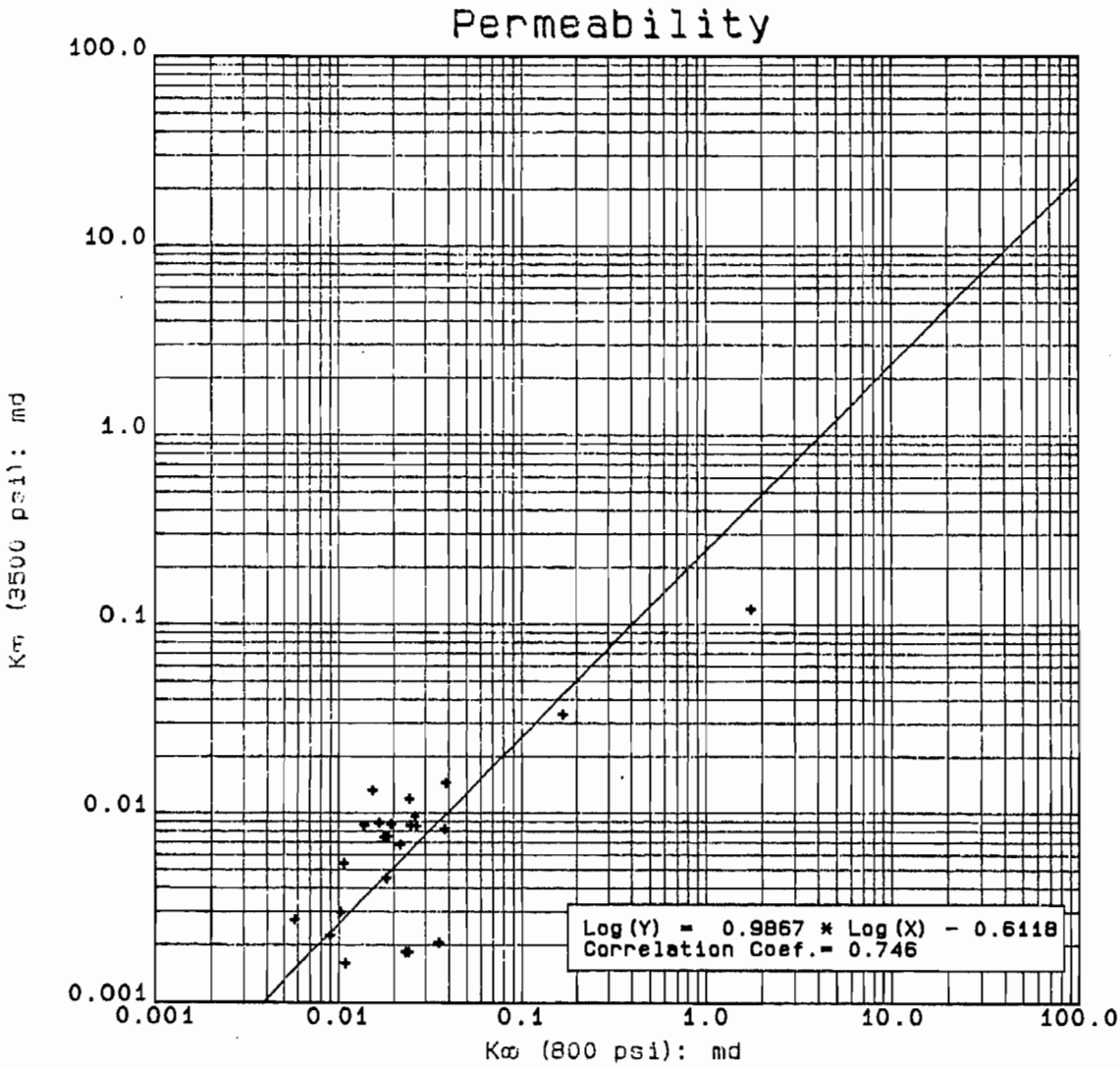
Core Laboratories 12-Oct-1990

- LEGEND -

——— - Median Value (2.5)
..... Arith. Average (2.8)
——— Cumulative Frequency
— — - Cumulative Capacity Lost

16 Samples

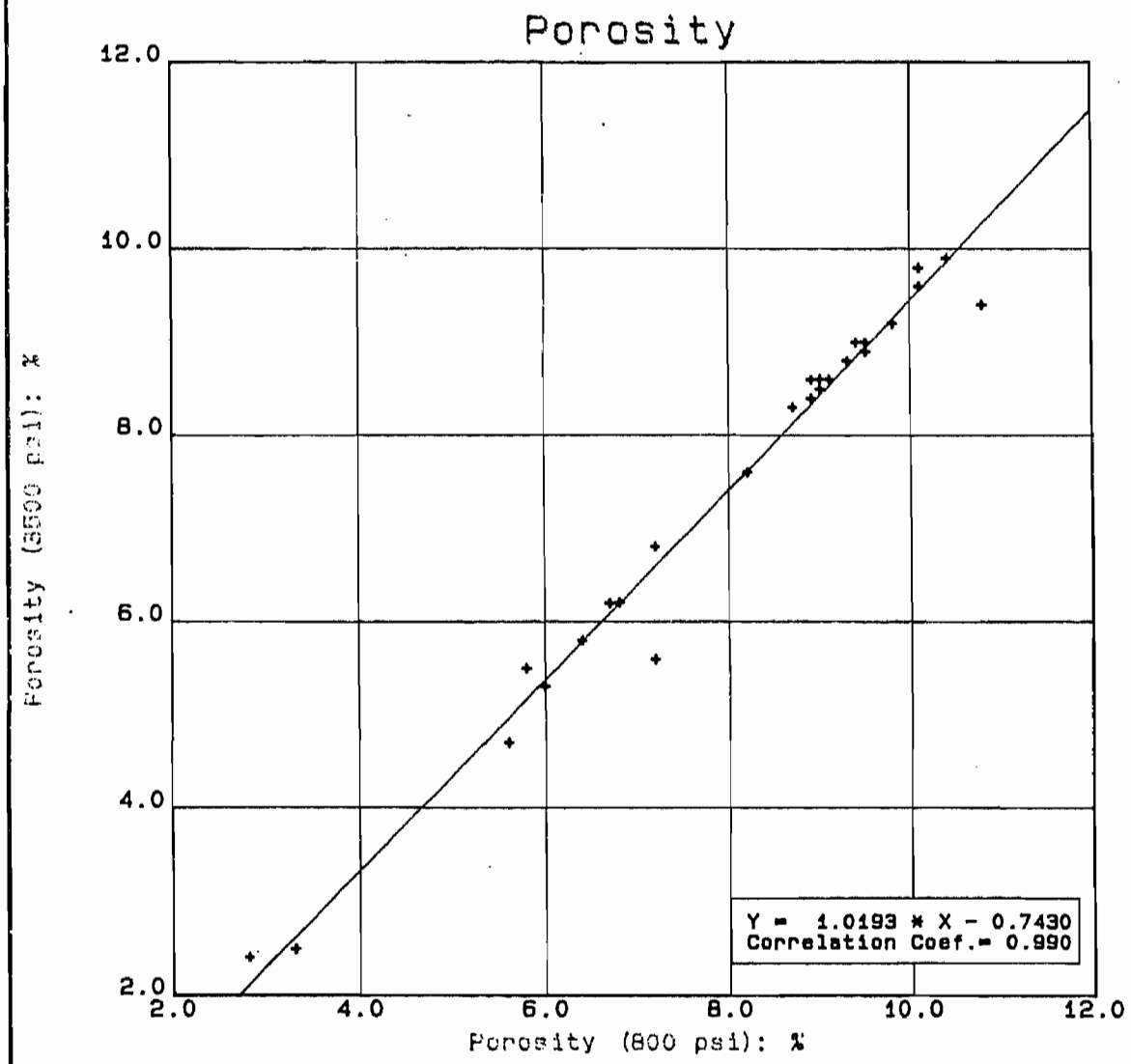
DATA COMPARISON



CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Cozzette Sandstone Formation
6904.0-6960.0 feet

Core Laboratories 12-Oct-1990

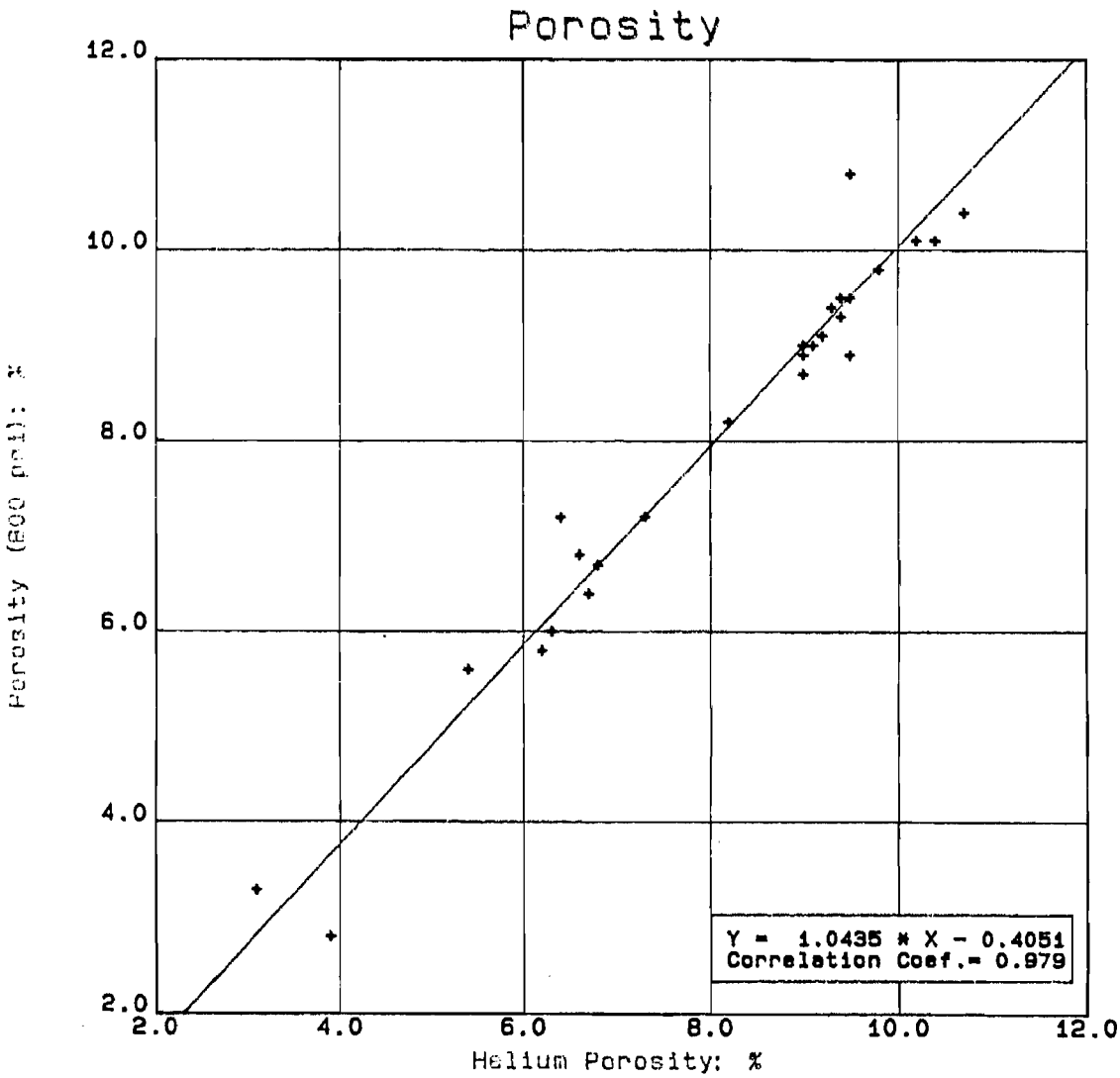
- LEGEND -
Cozzette



CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Cozzette Sandstone Formation
6904.0-6960.0 feet

Core Laboratories 12-Oct-1990

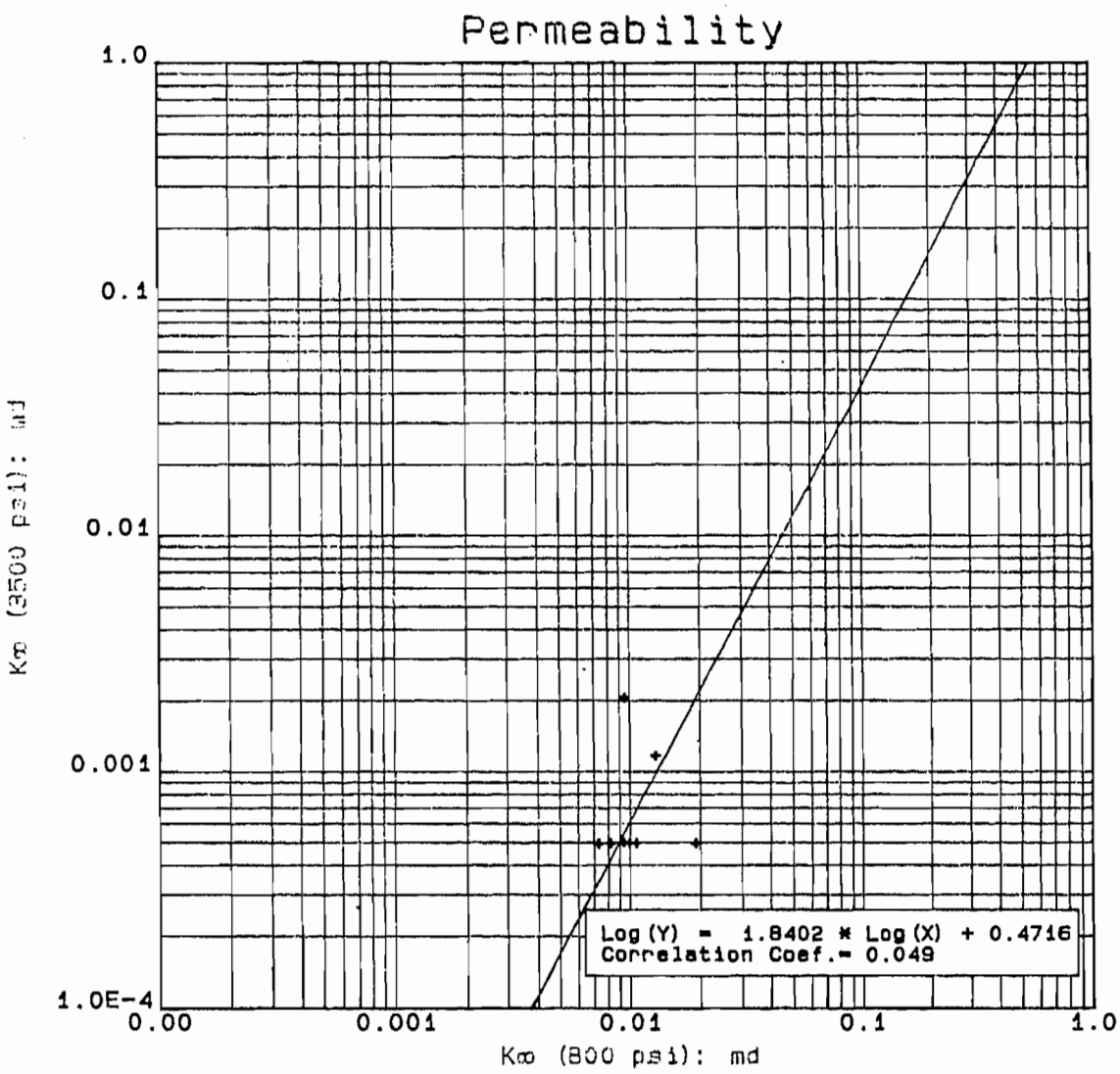
- LEGEND -
Cozzette



CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Cozzette Sandstone Formation
6904.0-6960.0 feet

Core Laboratories 12-Oct-1990

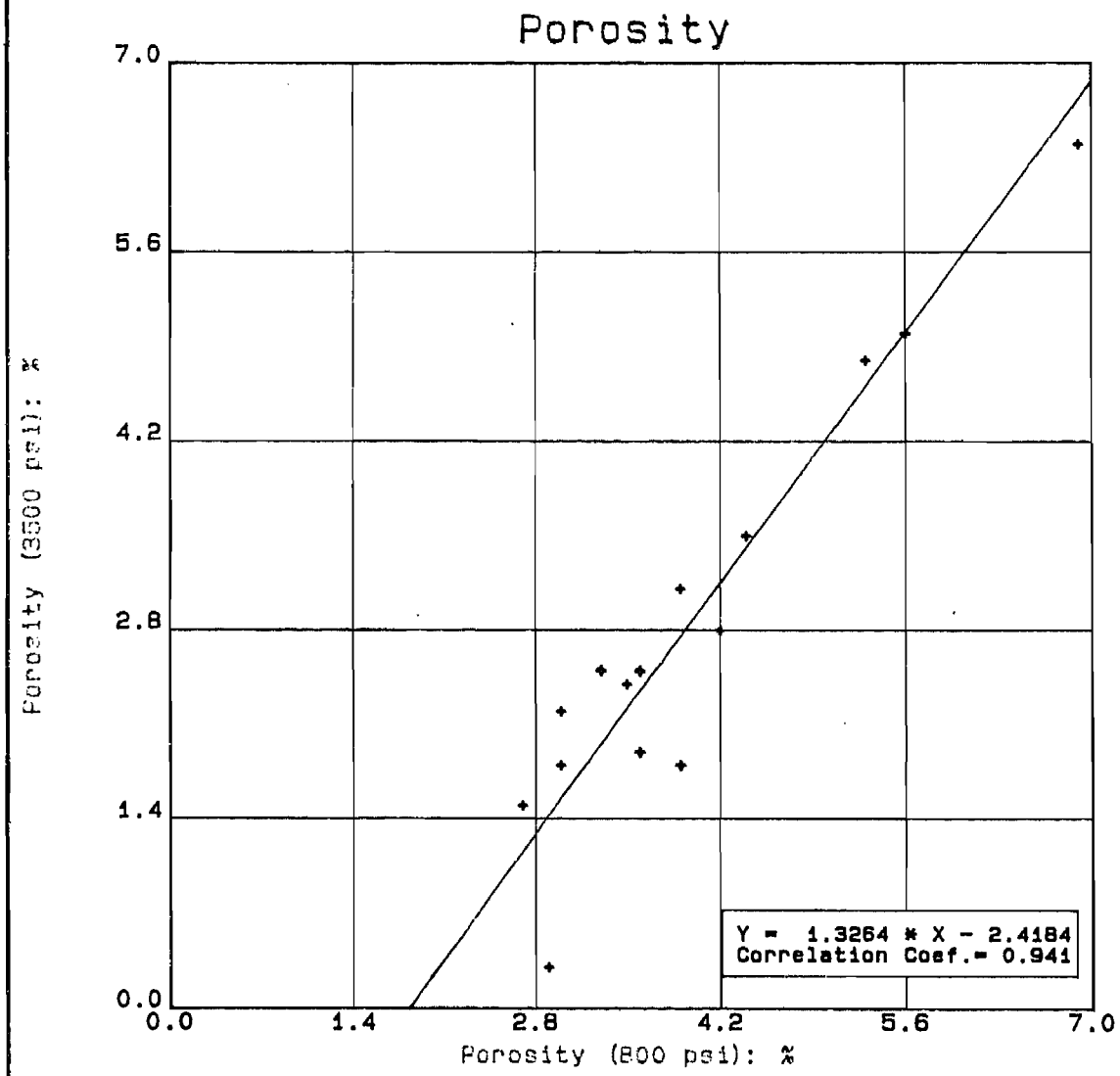
- LEGEND -
Cozzette



CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Corcoran Sandstone Formation
7092.0-7150.4 feet

Core Laboratories 12-Oct-1990

- LEGEND -
Corcoran



CER Corporation/Fuelco
FEE E-22-10-94-S Well
Plateau Creek Field
Mesa County, Colorado
Corcoran Sandstone Formation
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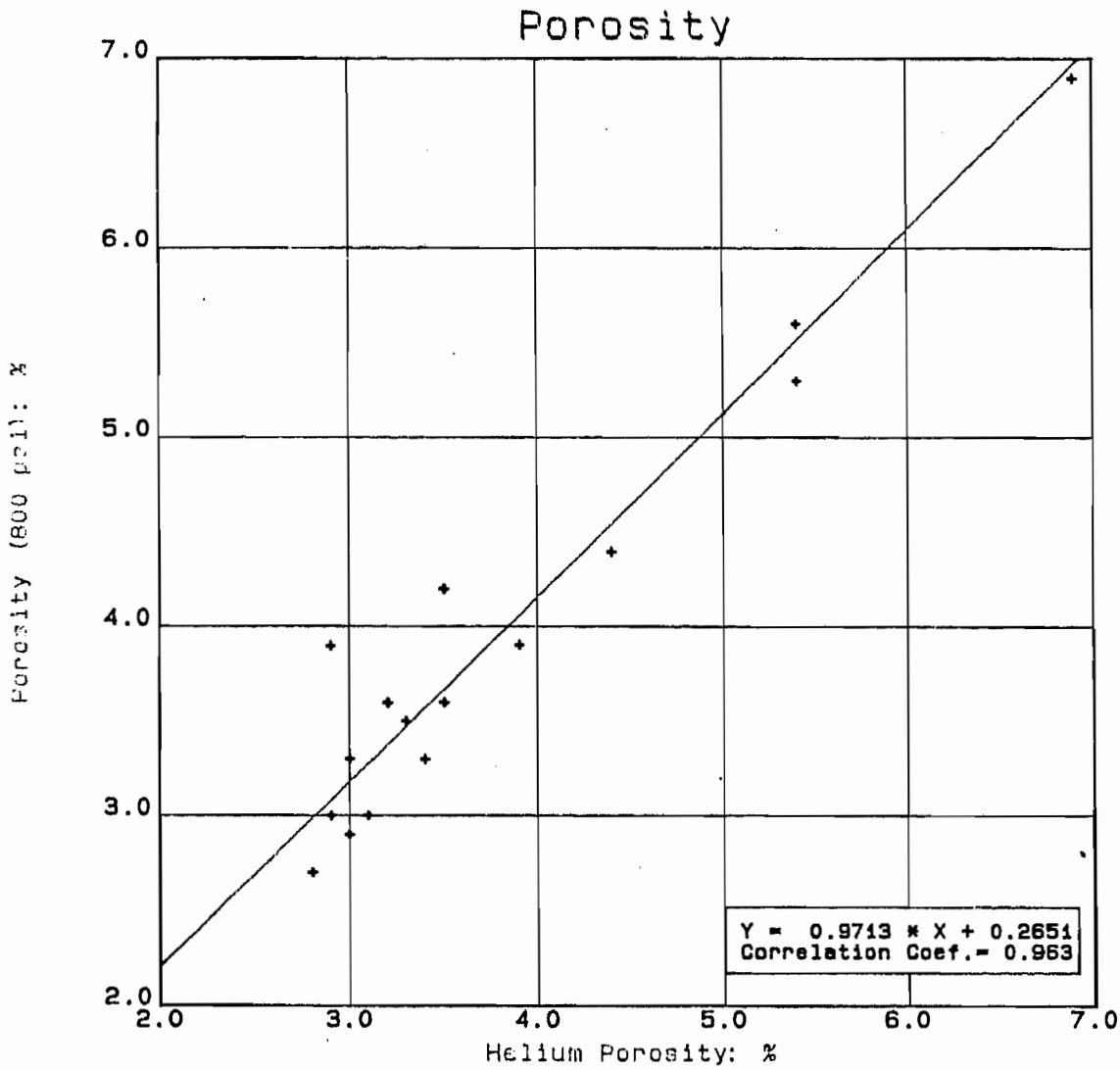
Core Laboratories 12-Oct-1990

- LEGEND -
Corcoran



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- LEGEND -
Corcoran

Correlation Coregraph

CER Corporation/Fuelco
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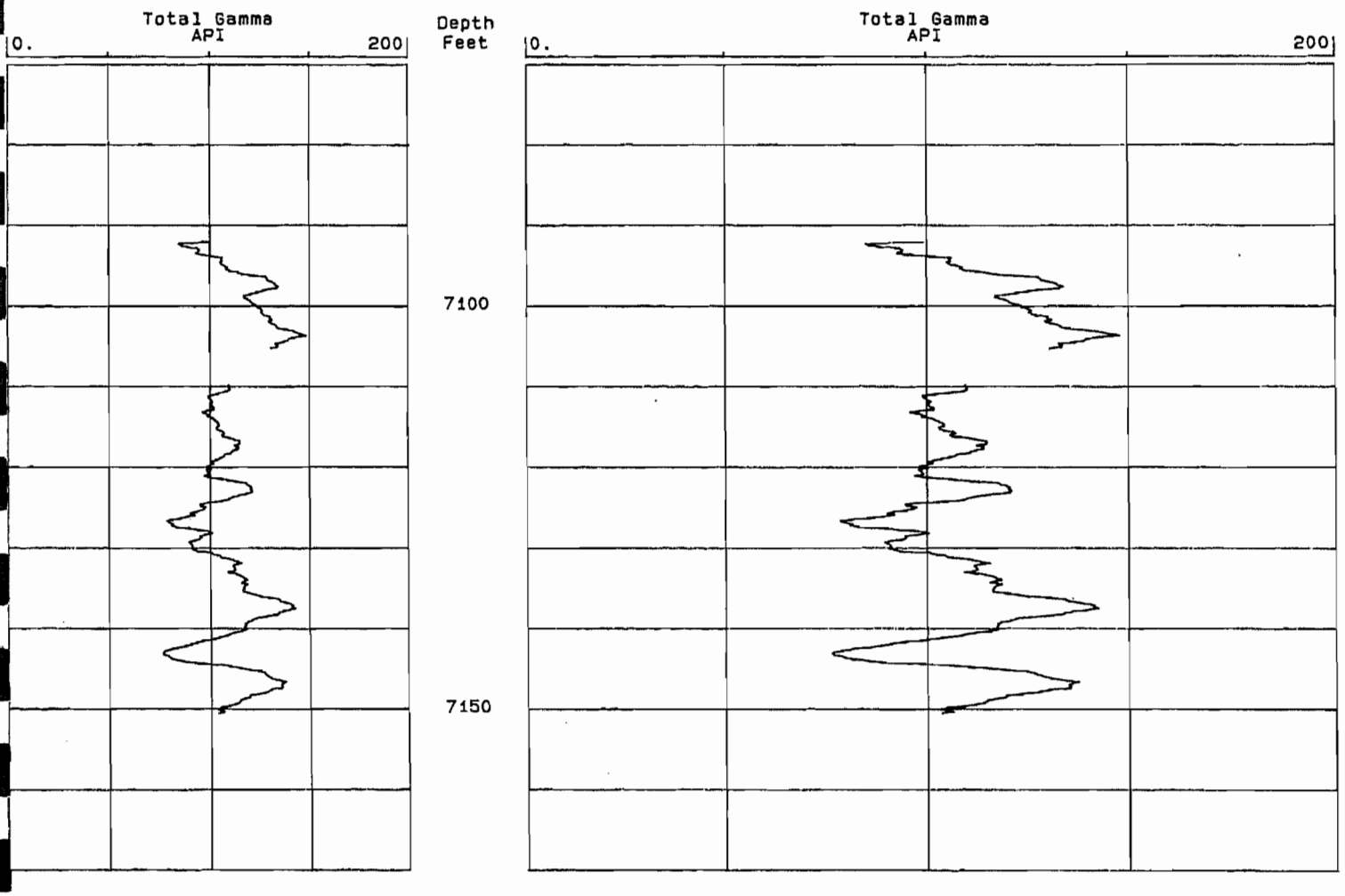
Vertical Scale
5.00 in = 100.0 ft