CORE LABORATORIES

CORE ANALYSIS REPORT

FOR

CHEVRON U.S.A., INC.

A.G.U. NO. 206
ARROWHEAD GRAYBURG UNIT FIELD
LEA COUNTY, NEW MEXICO

CORELAB

PETROLEUM SERVICES

December 1, 1995

CHEVRON U.S.A., INC.
P.O. Box 1150
Midland, Texas 79702

File No.: 57181-17352
Subject: Core Analysis
AGU No. 206
Arrowhead Grayburg Unit Field
Lea County, New Mexico

Gentlemen:

The subject well was cored using diamond coring equipment and air mist to obtain 3 1/2 inch diameter cores from 3781 to 3959 feet from the Grayburg formation.

Core analysis data is presented in tabular and graphical form for your convenience. A porosity vs. permeability plot was prepared for statistical evaluation.

We trust these data will be useful in the evaluation of your property and thank you for the opportunity of serving you.

Very truly yours,

CORE LABORATORIES, INC.

Dean Olson

Dean Olson
Laboratory Supervisor

DO/ym

CHEVRON U.S.A., INC.
AGU No. 206
File No. 57181-17352
Procedural Page

The cores were preserved at the wellsite in CO_2 atmosphere and transported to Midland by Core Laboratories personnel.

A Core Gamma Log was recorded for downhole E-log correlation.

Fresh core was taken from selected intervals and preserved in CoreSeal.

Core analysis was made from selected intervals requested on full diameter samples.

Fluid removal was achieved using a gas solvent extraction method.

Fluid saturations were determined using controlled temperature downdraft retort technique.

Porosity was determined by direct pore volume measurement using Boyle's law helium expansion. Bulk volume was measured by Archimedes Principle. Grain density was calculated from dry weight, bulk volume and pore volume measurements.

$$\text{Grain Density} = \frac{\text{Dry Weight}}{\text{Bulk Vol.} - \text{Pore Vol.}}$$

Steady State Air Permeability was measured in two horizontal directions and vertically while the core was confined in a Hassler rubber sleeve.

The core was slabbed and boxed after analysis.

The core was placed into our Midland core storage facility.

CORE LABORATORIES

CHEVRON U.S.A., INC.
A.G.U. NO. 206
2310' FSL & 330' FWL, SEC. 12, T-22-S, R-36-E
LEA COUNTY, NEW MEXICO

Field : ARROWHEAD GRAYBURG UNIT FI
Formation : GRAYBURG
Coring Fluid : AIR MIST
Elevation : 3497' GL

File No.: 57181-17352
Date : 11-10-95
API No. : 30-025-08890
Analysts: OLSON

CORE ANALYSIS RESULTS

	SAMPLE NUMBER	DEPTH ft	PERMEABILITY (MAXIMUM) Kair md	PERMEABILITY (90 DEG) Kair md	PERMEABILITY (VERTICAL) Kair md	POROSITY (HELIUM) %	SATURATION (PORE VOLUME) OIL %	SATURATION (PORE VOLUME) WATER %	GRAIN DENSITY gm/cc	DESCRIPTION
		CORE NO. 1 3781-3826 CUT 45' REC 39.2'								
*	1	3781.0- 82.0		0.01	<.01	4.7	4.2	37.2	2.89	Dol frac
S*	2	3782.0- 83.0		<.01	0.14	3.0	18.4	36.7	2.88	Dol frac
	3	3783.0- 84.0	6.91	1.24	10.7	2.3	39.2	22.9	2.86	Dol frac
	4	3784.0- 85.0	0.27	0.23	0.17	4.7	28.7	12.9	2.88	Dol frac styl
*	5	3785.0- 86.0		<.01	<.01	1.0	36.5	55.9	2.84	Dol frac
	6	3786.0- 87.0	36.8	9.61	0.25	1.0	10.5	35.7	2.87	Dol frac styl
	7	3787.0- 88.0	515.	0.07	780.	4.4	24.3	11.1	2.88	Dol frac open/vert/frac
	8	3788.0- 89.0	0.92	0.47	0.16	4.8	26.1	14.6	2.86	Dol sli/frac styl
	9	3789.0- 90.0	0.18	0.11	<.01	5.9	21.3	27.0	2.86	Dol frac styl
S	10	3790.0- 91.0	0.47	0.33	0.12	7.3	21.2	25.2	2.86	Dol
	11	3791.0- 92.0	1.77	1.68	1.85	7.0	16.0	24.4	2.85	Dol sli/frac styl
	12	3792.0- 93.0	0.43	0.11	0.03	4.4	29.2	30.0	2.86	Dol sli/frac styl
S	13	3793.0- 94.0	0.89	0.14	0.11	4.4	33.2	30.2	2.85	Dol frac styl
	14	3794.0- 95.0	10.5	10.3	0.43	5.6	9.8	37.1	2.84	Dol sli/frac vug
	15	3795.0- 96.0	0.03	0.02	<.01	4.6	6.0	64.6	2.84	Dol sdy slty lam
	16	3796.0- 97.0	0.18	0.14	0.12	4.2	0.0	89.2	2.79	Sltst v/dol sli/sdy
	17	3797.0- 98.0	0.95	0.67	3.15	8.1	20.0	13.9	2.84	Dol sli/frac
S	18	3798.0- 99.0	27.4	20.1	11.5	9.9	24.9	14.9	2.85	Dol sli/frac p.p.
	19	3799.0- 00.0	152.	103.	139.	10.2	26.1	17.1	2.84	Dol frac open/vert/frac p.p.
	20	3800.0- 01.0	0.11	0.07	<.01	9.4	17.3	23.6	2.81	Dol sli/slty
	21	3801.0- 02.0	0.04	0.03	<.01	10.2	8.0	23.0	2.79	Dol slty
	22	3802.0- 03.0	0.04	0.03	<.01	6.2	1.9	44.7	2.84	Dol frac styl
	23	3803.0- 04.0	2.55	1.49	1.94	10.1	25.6	14.8	2.83	Dol sli/slty
	24	3804.0- 05.0	0.09	0.07	0.16	7.6	16.4	25.7	2.85	Dol sli/vug
	25	3805.0- 06.0	2.36	1.67	14.4	7.5	26.2	23.3	2.85	Dol frac open/vert/frac

CORE LABORATORIES

CHEVRON U.S.A., INC.
A.G.U. NO. 206

Field : ARROWHEAD GRAYBURG UNIT
Formation : GRAYBURG

File No.: 57181-17352
Date : 11-10-95

CORE ANALYSIS RESULTS

SAMPLE NUMBER		DEPTH ft	PERMEABILITY (MAXIMUM) Kair md	PERMEABILITY (90 DEG) Kair md	PERMEABILITY (VERTICAL) Kair md	POROSITY (HELIUM) %	SATURATION (PORE VOLUME) OIL %	SATURATION (PORE VOLUME) WATER %	GRAIN DENSITY gm/cc	DESCRIPTION
	26	3806.0- 07.0	0.09	0.07	0.12	9.2	21.0	20.5	2.80	Dol
S	27	3807.0- 08.0	0.07	0.04	0.04	10.0	20.3	19.5	2.79	Dol slty
	28	3808.0- 09.0	0.12	0.05	0.13	8.8	19.4	18.7	2.81	Dol
	29	3809.0- 10.0	0.11	0.06	<.01	8.1	21.2	22.1	2.81	Dol
	30	3810.0- 11.0	206.	0.48	773.	3.8	7.7	65.2	2.87	Dol frac vert/frac sli/vug
	31	3811.0- 12.0	9.51	0.94	0.45	3.1	6.6	73.2	2.86	Dol frac
	32	3812.0- 13.0	0.39	0.27	0.16	6.1	2.8	55.4	2.83	Dol slty sli/frac shlam
	33	3813.0- 14.0	0.97	0.51	0.95	6.6	19.8	19.6	2.86	Dol sli/frac styl
	34	3814.0- 15.0	0.12	0.11	0.12	5.1	19.4	35.8	2.84	Dol sli/frac styl
	35	3815.0- 16.0	0.20	0.12	0.38	7.8	23.4	23.1	2.84	Dol shlam
	36	3816.0- 17.0	1.37	1.25	1.27	11.0	22.9	20.8	2.84	Dol
S	37	3817.0- 18.0	0.17	0.13	0.61	7.3	19.0	27.4	2.85	Dol frac
	38	3818.0- 19.0	0.56	0.43	0.41	6.2	12.0	32.1	2.85	Dol frac
S	39	3819.0- 20.0	0.46	0.23	0.22	6.6	23.6	19.2	2.85	Dol sli/frac
*	40	3820.0- 20.2		0.06	0.05	8.3	9.2	39.3	2.85	Dol frac
		3820.2- 26.0								Lost core
				CORE NO. 2 3826-3832 CUT 6' REC 5.5'						
	41	3826.0- 27.0	2.65	2.17	3.90	5.9	9.7	45.6	2.85	Dol frac vug styl
S	42	3827.0- 28.0	0.91	0.83	0.55	7.4	25.4	26.6	2.84	Dol sli/frac
	43	3828.0- 29.0	0.03	0.02	0.03	7.9	8.1	66.3	2.79	Dol frac sli/slty
	44	3829.0- 30.0	0.05	0.05	0.08	8.6	2.9	59.7	2.75	Dol slty
	45	3830.0- 31.0	0.01	0.01	0.05	6.6	10.9	52.6	2.83	Dol
	46	3831.0- 31.5	0.17	0.06	0.05	2.3	3.5	90.6	2.83	Dol vert/frac shlam
		3831.5- 32.0								Lost core

CORE LABORATORIES

CHEVRON U.S.A., INC.
A.G.U. NO. 206

Field : ARROWHEAD GRAYBURG UNIT
Formation : GRAYBURG

File No.: 57181-17352
Date : 11-10-95

CORE ANALYSIS RESULTS

	SAMPLE NUMBER	DEPTH ft	PERMEABILITY (MAXIMUM) Kair md	PERMEABILITY (90 DEG) Kair md	PERMEABILITY (VERTICAL) Kair md	POROSITY (HELIUM) %	SATURATION (PORE VOLUME) OIL %	SATURATION (PORE VOLUME) WATER %	GRAIN DENSITY gm/cc	DESCRIPTION
			CORE NO. 3 3832-3863 CUT 31' REC 20'							
	47	3832.0- 33.0	1.04	0.14	0.70	4.5	13.1	49.5	2.84	Dol open/vert/frac sli/vug
	48	3833.0- 34.0	0.64	0.19	0.52	5.7	23.3	38.1	2.83	Dol vert/frac
	49	3834.0- 35.0	4.55	4.49	3.24	9.3	23.7	24.8	2.83	Dol
	50	3835.0- 36.0	8.26	0.03	0.13	2.9	19.6	68.0	2.85	Dol vert/frac
	51	3836.0- 37.0	0.20	0.03	<.01	5.5	30.6	24.7	2.83	Dol vert/frac p.p.
	52	3837.0- 38.0	0.17	0.15	0.27	4.9	25.5	28.4	2.84	Dol
S	53	3838.0- 39.0	0.19	0.12	<.01	3.9	20.1	65.1	2.84	Dol tr/pyr frac styl
	54	3839.0- 40.0	1.64	0.38	3.13	5.4	14.3	49.9	2.86	Dol open/vert/frac vug styl
	55	3840.0- 41.0	21.9	14.0	0.58	8.7	11.8	72.3	2.81	Dol vert/frac vug
	56	3841.0- 42.0	6057.	0.11	3330.	1.6	12.6	72.3	2.84	Dol frac open/vert/frac p.p.
	57	3842.0- 43.0	1895.	0.91	3161.	2.7	24.3	51.6	2.87	Dol tr/pyr frac vert/frac styl
	58	3843.0- 44.0	4765.	0.75	5775.	10.0	25.9	20.7	2.86	Dol open/vert/frac
	59	3844.0- 45.0	2.32	1.74	0.17	4.6	21.5	43.0	2.87	Dol vert/frac sli/vug
	60	3845.0- 46.0	0.51	0.41	0.14	2.7	27.7	53.8	2.83	Dol frac sli/vug
S	61	3846.0- 47.0	51.9	50.9	6.53	10.7	22.4	21.1	2.84	Dol vert/frac p.p.
	62	3847.0- 48.0	10.2	9.58	0.27	1.5	23.0	51.2	2.84	Dol frac
	63	3848.0- 49.0	3.05	1.22	0.07	2.0	0.0	82.4	2.85	Dol frac styl
*	64	3849.0- 50.0		<.01	<.01	2.7	0.0	83.6	2.87	Dol vert/frac
	65	3850.0- 51.0	0.15	0.11	<.01	3.0	19.0	59.1	2.83	Dol sli/frac p.p.
	66	3851.0- 52.0	1250.	78.2	77.4	13.4	24.0	23.2	2.84	Dol
		3852.0- 64.0								Lost Core
			CORE NO. 4 3864-3899 CUT 35' REC 33.2'							
	67	3864.0- 65.0	1.44	1.15	0.05	3.6	3.0	80.9	2.85	Dol tr/pyr vert/frac styl
	68	3865.0- 66.0	5341.	5341.	2023.	4.1	10.2	40.9	2.85	Dol vert/frac vuy styl
S	69	3866.0- 67.0	565.	1.18	2529.	7.5	29.3	17.9	2.85	Dol vert/frac

CORE LABORATORIES

CHEVRON U.S.A., INC.
A.G.U. NO. 206

Field : ARROWHEAD GRAYBURG UNIT
Formation : GRAYBURG

File No.: 57181-17352
Date : 11-10-95

CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH ft	PERMEABILITY (MAXIMUM) Kair md	PERMEABILITY (90 DEG) Kair md	PERMEABILITY (VERTICAL) Kair md	POROSITY (HELIUM) %	SATURATION (PORE VOLUME) OIL %	SATURATION (PORE VOLUME) WATER %	GRAIN DENSITY gm/cc	DESCRIPTION
S 70	3867.0- 68.0	6.46	5.83	2.82	8.4	28.8	18.6	2.83	Dol vert/frac styl
71	3868.0- 69.0	0.41	0.31	0.03	7.9	17.4	31.9	2.81	Dol tr/pyr vert/frac styl
72	3869.0- 70.0	0.32	0.26	<.01	4.2	7.0	51.1	2.83	Dol sli/shy shlam styl
73	3870.0- 71.0	0.23	0.14	<.01	8.4	22.3	20.0	2.80	Dol styl
S 74	3871.0- 72.0	0.13	0.10	0.04	8.5	19.5	22.2	2.80	Dol sli/shy
75	3872.0- 73.0	0.18	0.16	0.06	10.4	16.2	24.9	2.76	Dol v/sdy tr/pyr
76	3873.0- 74.0	0.05	0.04	0.03	10.1	16.3	27.7	2.77	Dol slty tr/pyr
77	3874.0- 75.0	0.46	0.13	<.01	7.6	13.1	31.3	2.81	Dol sli/sdy styl
78	3875.0- 76.0	2.46	1.68	0.49	7.5	28.0	27.5	2.83	Dol styl
79	3876.0- 77.0	1.18	1.16	0.26	8.1	24.5	25.1	2.84	Dol p.p. styl
80	3877.0- 78.0	0.09	0.04	0.02	6.3	9.3	54.2	2.86	Dol vug
81	3878.0- 79.0	0.09	0.07	0.03	4.0	5.3	69.7	2.86	Dol vug
82	3879.0- 80.0	0.71	0.62	2.94	4.5	31.1	35.4	2.84	Dol sli/slty vert/frac open/vert/frac
83	3880.0- 81.0	7.32	4.88	0.52	6.3	27.1	22.0	2.85	Dol p.p. styl
S 84	3881.0- 82.0	0.83	0.82	0.26	7.8	27.9	23.5	2.84	Dol vert/frac
85	3882.0- 83.0	0.20	0.17	<.01	7.7	23.8	21.7	2.87	Dol p.p. styl
86	3883.0- 84.0	1173.	15.7	0.96	3.2	17.4	36.2	2.84	Dol vert/frac p.p.
87	3884.0- 85.0	2.26	0.12	4.45	5.9	25.5	24.6	2.84	Dol vert/frac p.p. styl
88	3885.0- 86.0	0.33	0.29	0.28	9.7	21.6	29.3	2.85	Dol p.p.
89	3886.0- 87.0	2.13	1.28	31.6	12.7	18.4	19.4	2.87	Dol p.p. open/vert/frac
90	3887.0- 88.0	1.17	1.06	0.44	8.5	23.3	26.9	2.85	Dol vert/frac p.p.
91	3888.0- 89.0	0.62	0.36	0.16	5.7	10.2	48.3	2.84	Dol vert/frac styl
S 92	3889.0- 90.0	7.03	4.45	0.28	10.1	11.6	24.4	2.86	Dol sli/vug ool
93	3890.0- 91.0	0.68	0.50	0.26	7.6	11.4	38.0	2.85	Dol sli/vug ool
94	3891.0- 92.0	6.43	3.51	0.96	7.7	25.6	20.0	2.85	Dol styl
S 95	3892.0- 93.0	7.15	2.79	0.22	7.0	20.1	32.8	2.84	Dol sli/vug styl
96	3893.0- 94.0	0.73	0.68	0.18	8.2	25.7	21.9	2.84	Dol vert/frac styl
97	3894.0- 95.0	0.46	0.39	0.04	7.0	20.5	26.3	2.84	Dol styl
98	3895.0- 96.0	0.98	0.47	0.15	7.8	17.5	27.4	2.84	Dol styl

CORE LABORATORIES

CHEVRON U.S.A., INC.
A.G.U. NO. 206

Field : ARROWHEAD GRAYBURG UNIT
Formation : GRAYBURG

File No.: 57181-17352
Date : 11-10-95

CORE ANALYSIS RESULTS

	SAMPLE NUMBER	DEPTH ft	PERMEABILITY (MAXIMUM) Kair md	PERMEABILITY (90 DEG) Kair md	PERMEABILITY (VERTICAL) Kair md	POROSITY (HELIUM) %	SATURATION (PORE VOLUME) OIL %	SATURATION (PORE VOLUME) WATER %	GRAIN DENSITY gm/cc	DESCRIPTION
	99	3896.0- 97.0	0.85	0.80	<.01	8.1	20.7	25.2	2.84	Dol sli/slty styl
*	100	3897.0- 97.2		0.11		6.7	1.6	48.0	2.85	Dol sli/slty frac styl
		3897.2- 99.0								Lost core
		CORE NO. 5 3899-3959 CUT 60' REC 57.2'								
	101	3899.0- 00.0	0.09	0.05	0.09	7.4	12.5	28.6	2.82	Dol vert/frac styl
	102	3900.0- 01.0	1.25	0.77	1.27	7.7	16.3	28.1	2.83	Dol vert/frac styl
S	103	3901.0- 02.0	0.49	0.33	0.12	9.2	17.1	27.8	2.81	Dol vert/frac styl
	104	3902.0- 03.0	0.88	0.69	0.03	12.7	13.0	38.4	2.70	Sd dol styl
	105	3903.0- 04.0	2.04	1.65	0.19	12.3	15.5	39.1	2.72	Sd v/dol styl
	106	3904.0- 05.0	0.06	0.05	0.04	9.0	8.2	58.8	2.73	Sd v/dol
	107	3905.0- 06.0	0.03	0.02	<.01	10.2	5.3	52.2	2.78	Dol sdy
	108	3906.0- 07.0	0.04	0.03	0.04	11.1	4.0	54.7	2.77	Dol v/sdy
	109	3907.0- 08.0	0.05	0.03	<.01	11.2	9.0	37.2	2.77	Dol sdy
	110	3908.0- 09.0	0.22	0.11	<.01	11.3	10.2	46.6	2.82	Dol styl
	111	3909.0- 10.0	0.18	0.10	<.01	7.6	7.5	62.5	2.82	Dol vert/frac lam
S	112	3910.0- 11.0	4270.	0.17	1686.	10.4	29.8	23.7	2.88	Dol vert/frac open/vert/frac
	113	3911.0- 12.0	0.32	0.24	0.10	7.3	16.6	38.1	2.86	Dol vert/frac styl
	114	3912.0- 13.0	0.17	0.12	0.11	6.5	15.4	22.0	2.87	Dol styl
	115	3913.0- 14.0	7.57	1.76	6.86	4.1	22.8	47.7	2.85	Dol vert/frac vug
	116	3914.0- 15.0	0.04	0.03	<.01	8.4	14.0	41.9	2.80	Dol styl
S	117	3915.0- 16.0	0.33	0.28	0.02	9.4	16.9	21.7	2.82	Dol styl
	118	3916.0- 17.0	0.04	0.04	<.01	11.0	15.4	41.5	2.80	Dol
	119	3917.0- 18.0	0.09	0.06	<.01	10.3	13.7	51.1	2.81	Dol styl
	120	3918.0- 19.0	0.76	0.74	1.62	9.8	21.6	24.4	2.86	Dol vert/frac styl
	121	3919.0- 20.0	2.49	0.24	1.87	9.8	26.3	28.4	2.85	Dol styl
S	122	3920.0- 21.0	2.95	2.87	3.26	12.8	25.3	30.1	2.87	Dol
	123	3921.0- 22.0	0.67	0.57	0.65	12.1	23.3	31.9	2.85	Dol p.p.

CORE LABORATORIES

CHEVRON U.S.A., INC.
A.G.U. NO. 206

Field : ARROWHEAD GRAYBURG UNIT
Formation : GRAYBURG

File No.: 57181-17352
Date : 11-10-95

CORE ANALYSIS RESULTS

	SAMPLE NUMBER	DEPTH ft	PERMEABILITY (MAXIMUM) Kair md	PERMEABILITY (90 DEG) Kair md	PERMEABILITY (VERTICAL) Kair md	POROSITY (HELIUM) %	SATURATION (PORE VOLUME) OIL %	SATURATION (PORE VOLUME) WATER %	GRAIN DENSITY gm/cc	DESCRIPTION
	124	3922.0- 23.0	0.72	0.47	0.24	9.5	25.6	22.4	2.84	Dol vert/frac styl
	125	3923.0- 24.0	0.08	0.04	<.01	8.8	8.0	67.0	2.81	Dol styl
	126	3924.0- 25.0	0.04	0.03	<.01	5.8	0.0	93.4	2.74	Dol v/sdy
	127	3925.0- 26.0	0.05	0.03	<.01	6.4	3.1	58.6	2.83	Dol
	128	3926.0- 27.0	0.02	0.02	<.01	7.1	0.0	78.6	2.84	Dol styl
	129	3927.0- 28.0	0.02	0.02	<.01	8.4	0.0	81.9	2.81	Dol
	130	3928.0- 29.0	<.01	<.01	<.01	6.4	0.0	89.4	2.72	Dol
	131	3929.0- 30.0	0.05	0.05	<.01	12.2	2.8	58.4	2.79	Dol sdy
	132	3930.0- 31.0	0.23	0.23	0.04	13.5	3.6	61.0	2.79	Dol anhy vert/frac
	133	3931.0- 32.0	0.07	0.04	<.01	6.1	8.4	88.3	2.72	Sd v/dol styl
	134	3932.0- 33.0	0.22	0.06	<.01	12.8	8.8	51.4	2.80	Dol sli/sdy styl
S	135	3933.0- 34.0	0.06	0.03	<.01	11.4	13.4	29.8	2.82	Dol
	136	3934.0- 35.0	0.37	0.28	0.36	12.6	16.8	34.2	2.82	Dol vert/frac
S	137	3935.0- 36.0	0.41	0.14	<.01	9.7	14.3	36.7	2.84	Dol vert/frac
	138	3936.0- 37.0	0.10	0.07	0.04	8.4	14.3	36.6	2.85	Dol vert/frac
	139	3937.0- 38.0	0.11	0.09	0.04	10.2	9.2	37.5	2.85	Dol
S	140	3938.0- 39.0	0.98	0.90	0.55	12.4	18.1	25.6	2.82	Dol sli/vug
*	141	3939.0- 40.0		0.25		12.6	24.8	30.3	2.87	Dol frac
.	142	3940.0- 41.0	2.81	2.73	2.81	12.6	25.3	26.7	2.85	Dol
	143	3941.0- 42.0	12.6	0.19	0.04	12.2	14.2	39.5	2.83	Dol p.p. styl
	144	3942.0- 43.0	2.94	2.76	<.01	13.7	16.2	30.0	2.72	Sd v/dol p.p.
	145	3943.0- 44.0	7.24	6.97	0.07	14.0	16.7	35.0	2.78	Dol sdy p.p. styl
S	146	3944.0- 45.0	219.	0.31	3.07	9.2	21.3	29.3	2.83	Dol vert/frac
	147	3945.0- 46.0	26.6	25.3	1.79	16.3	16.2	25.1	2.84	Dol vert/frac
	148	3946.0- 47.0	5.83	3.95	0.27	10.3	18.4	20.9	2.84	Dol vert/frac p.p. styl
	149	3947.0- 48.0	2.38	2.29	0.08	13.6	17.7	23.3	2.79	Dol sdy sli/vug
	150	3948.0- 49.0	41.2	38.7	0.21	13.7	20.3	24.9	2.84	Dol styl
	~~151~~	~~3949.0- 50.0~~	~~61.7~~	~~50.5~~	~~14.1~~	~~12.7~~	20.3	25.0	2.84	Dol styl
	152	3950.0- 51.0	0.48	0.44	0.07	10.1	17.5	22.9	2.81	Dol v/shy p.p. styl

CORE LABORATORIES

CHEVRON U.S.A., INC.
A.G.U. NO. 206

Field : ARROWHEAD GRAYBURG UNIT
Formation : GRAYBURG

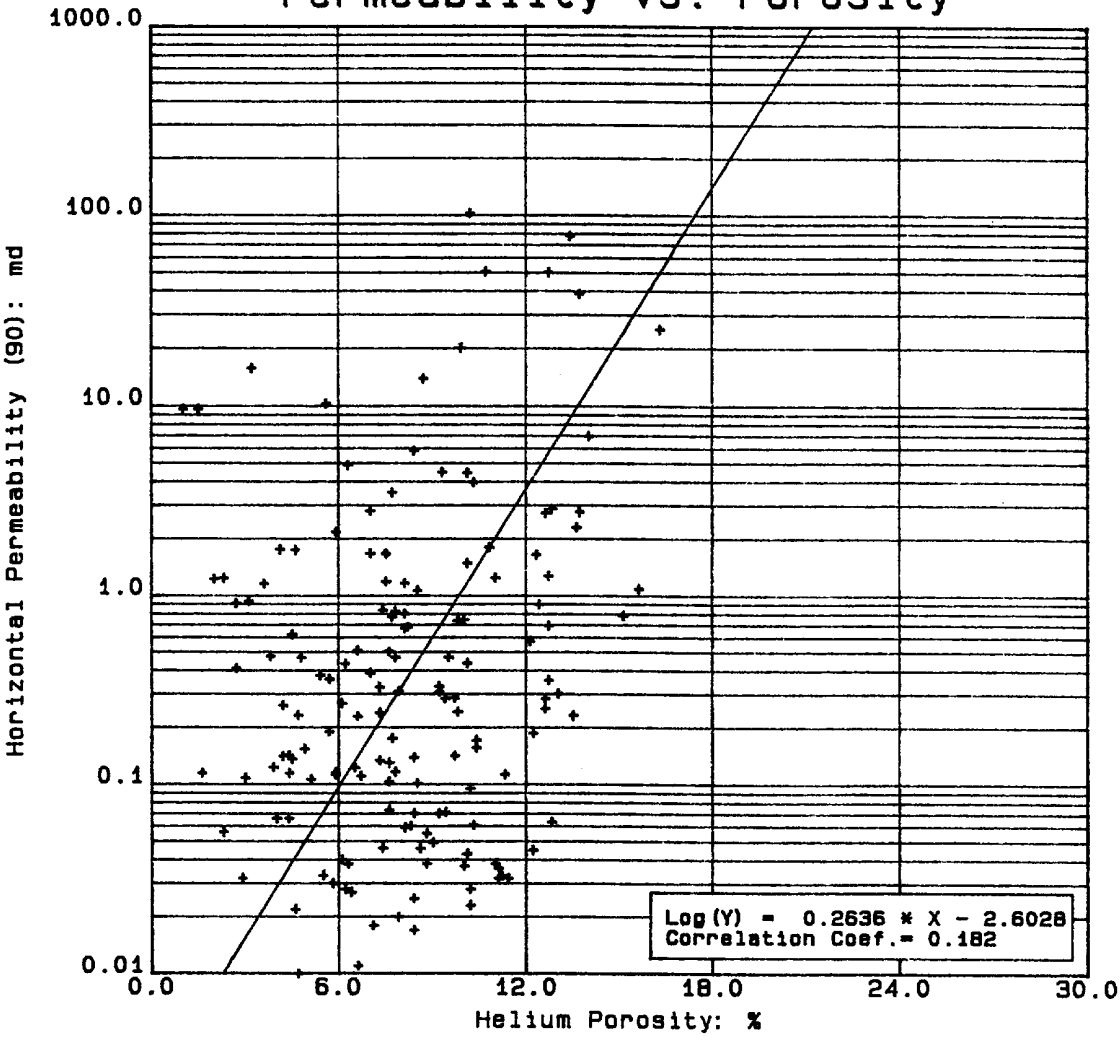
File No.: 57181-17352
Date : 11-10-95

C O R E A N A L Y S I S R E S U L T S

	SAMPLE NUMBER	DEPTH ft	PERMEABILITY (MAXIMUM) Kair md	PERMEABILITY (90 DEG) Kair md	PERMEABILITY (VERTICAL) Kair md	POROSITY (HELIUM) %	SATURATION (PORE VOLUME) OIL %	SATURATION (PORE VOLUME) WATER %	GRAIN DENSITY gm/cc	DESCRIPTION
	153	3951.0- 52.0	0.39	0.35	0.16	12.7	13.8	30.3	2.76	Sd v/dol styl
	154	3952.0- 53.0	1.12	1.09	0.69	15.6	14.7	28.3	2.72	Sd dol pyr
	155	3953.0- 54.0	0.80	0.78	0.24	15.1	15.9	27.2	2.74	Sd v/dol pyr
	156	3954.0- 55.0	0.35	0.30	0.05	13.0	12.9	30.0	2.77	Dol sdy pyr
S	157	3955.0- 56.0	0.06	0.04	<.01	11.1	13.8	44.2	2.82	Dol v/sdy sli/vug styl
	158	3956.0- 56.2	1.88	1.81	1.49	10.8	18.7	21.0	2.85	Dol sdy styl
		3956.2- 59.0								Lost core

S INDICATES PRESERVED SAMPLE * INDICATES PLUG ANALYSIS

Permeability vs. Porosity



CHEVRON U.S.A., INC.

A.G.U. NO. 206

ARROWHEAD GRAYBURG UNIT FIELD

GRAYBURG (3781-3959 feet)

Core Laboratories 11-10-95

- LEGEND -

GRAYBURG

CORE LABORATORIES

CHEVRON U.S.A., INC.
A.G.U. NO. 206

Field : ARROWHEAD GRAYBURG UNIT
Formation : GRAYBURG

File No.: 57181-17352
Date : 11-10-95

TABLE I

SUMMARY OF CORE DATA

ZONE AND CUTOFF DATA

ZONE:	
Identification	GRAYBURG
Top Depth	3781.0 ft
Bottom Depth	3959.0 ft
Number of Samples	163
DATA TYPE:	
Porosity	(HELIUM)
Permeability	(MAXIMUM) Kair
CUTOFFS:	
Porosity (Minimum)	0.0 %
Porosity (Maximum)	100.0 %
Permeability (Minimum)	0.0100 md
Permeability (Maximum)	1000. md
Water Saturation (Maximum)	100.0 %
Oil Saturation (Minimum)	0.0 %
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	150
Thickness Represented	147.1 ft
POROSITY:	
Storage Capacity	1188.7 ϕ-ft
Arithmetic Average	8.1 %
Minimum	1.0 %
Maximum	16.3 %
Median	7.9 %
Standard Deviation	±3.2 %
GRAIN DENSITY:	
Arithmetic Average	2.83 gm/cc
Minimum	2.70 gm/cc
Maximum	2.89 gm/cc
Median	2.84 gm/cc
Standard Deviation	±0.04 gm/cc

PERMEABILITY:	
Flow Capacity	2119.8 md-ft
Arithmetic Average	15.0 md
Geometric Average	0.68 md
Harmonic Average	0.15 md
Minimum	0.01 md
Maximum	565. md
Median	0.51 md
Standard Dev. (Geom) --	$K \cdot 10^{\pm 0.954}$ md
HETEROGENEITY (Permeability):	
Dykstra-Parsons Var.	0.874
Lorenz Coefficient	0.931
AVERAGE SATURATIONS (Pore Volume):	
Oil	16.7 %
Water	34.9 %

CORE LABORATORIES

LITHOLOGICAL ABBREVIATIONS

Anhy, anhy	anhydrite (-ic)
Ark, ark	arkose (-ic)
bnd	band (-ed)
Brec, brec	breccia
Calc, calctc	calcite (-ic)
carb	carbonaceous
crs gr	course grained
Chk, chky	chalk (-y)
Cht, cht	chert (-y)
Cgl, cgl	conglomerate (-ic)
crs xln	coursely crystaline
dns	dense
Dol, dol	dolomite (-ic)
F	randomly oriented fractures
f	slightly fractured
f gr	fine grained
foss	fossil (-iferous)
f xln	finely crystalline
Gil	gilsonite
Glauc, glauc	glauconite (-itic)
Grt	granite
Gyp, gyp	gypsum (-iferous)
hor frac	perdominantly horizontally fractured
incl	inclusion (-ded)
intbd	interbedded
lam	lamina (-tions, -ated)
Lim, lim	limestone
med gr	mediam grain
Mtrx	matrix
NA	interval not analyzed
Nod, nod	nodules (-ar)
Ool, ool	oolite (-itic)
Pisol, pisol	pisolite, pisolitic
p.p.	pin-point (porosity)
Ptg	parting
Pyr, pyr	pyrite (-itized, -itic)
Sd, sdy	sand (-y)
Sh, shy	shale (-ly)
SHR	solid hydrocarbon residue
sli	slightly
Slt, slty	silt (-y)
styl	stylolite (-itic)
suc	sucrosic
Su, su	sulphur, sulphurous
TBFA	TOO BROKEN FOR ANALYSIS
Trip, trip	tripoli (-itic)
v	very
vf	predominantly vertically fractured
vug	vug (-gy)
xbd	crossbedded
xln	medium crystalline
xtl	crystal

THE FIRST WORD IN THE DESCRIPTION COLUMN OF THE CORE ANALYSIS REPORT DESCRIBES THE ROCK TYPE. FOLLOWING ARE ROCK MODIFIERS IN DECREASING ABUNDANCE AND MISCELLANEOUS DESCRIPTIVE TERMS.

DISTRIBUTION OF FINAL REPORTS

2cc CHEVRON USA, INC.
ATTN: MARK KAMM
PO BOX 1150
MIDLAND TX 79702

1cc NEW MEXICO OCD
CHAVES & LEA COUNTY
PO BOX 1980
HOBBS NM 88240

2cc STATE ENGINEER'S OFFICE
1900 WEST 2nd
ROSWELL NM 88201

1cc AMERICAN EXPLORATION CO.
ATTN: BOB HOGAN
2100 REPUBLIC BANK
700 LOUISIAN
HOUSTON TX 77002

1cc ARCO OIL & GAS CO.
ATTN: SAM KEASLER
BOX 1610
MIDLAND TX 79702

1cc EXXON COMMPANY
ATTN: R. R. HICKMAN
PO BOX 1700
MIDLAND TX 79702

1cc OXY, USA
ATTN: EDWARD J. BEHM
PO BOX 50250
MIDLAND TX 79710

1cc AMERADA HESS CORP.
ATTN: MNGR JV-US ONSHORE
BOX 2040
TULSA OK 74102

1cc CONOCO, INC.
ATTN: MARK MOSELY
10 DESTA DRIVE
MIDLAND TX 79705

1cc ENRON OIL & GAS CO.
PO BOX 2267
MIDLAND TX 79702

1cc OPERATING INC.
ATTN: HAL RASMUSSEN
6 DESTA DRIVE
SUITE 5850
MIDLAND TX 79705

1cc AMOCO PRODUCTION CO.
ATTN: J. C. ALLEN
BOX 3092
HOUSTON TX 77253

1cc DASCO ENERGY CORP.
DRAWER 2545
HOBBS NM 88240

1cc MARATHON OIL CO.
ATTN: R. F. UNGER
PO BOX 552
MIDLAND TX 79702

1cc THE WILLIAMS PARTNERSHIP
6 DESTA DRIVE
SUITE 5800
MIDLAND TX 79705

COMPLETION COREGRAPH

CHEVRON U.S.A., INC.

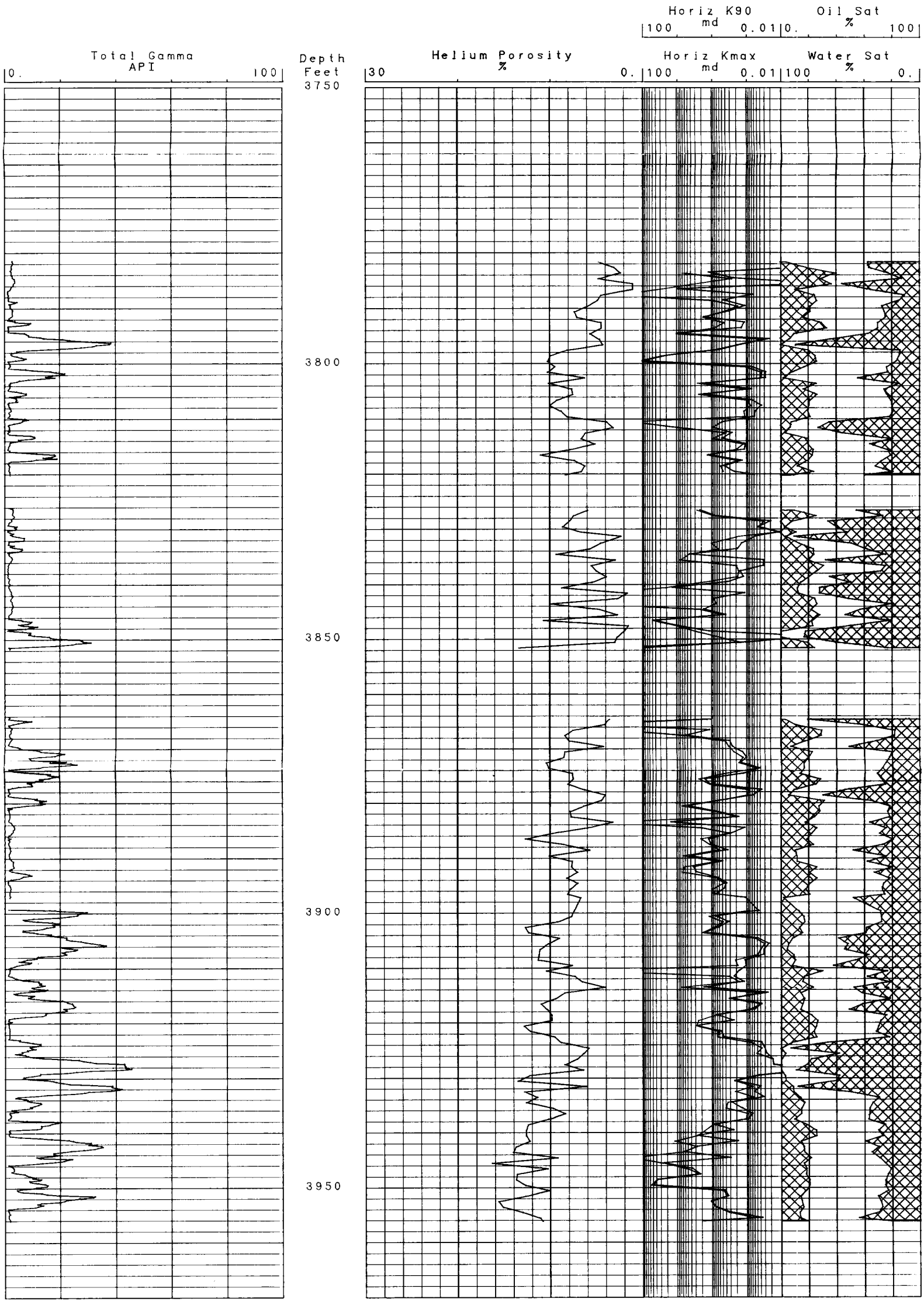
A.G.U. NO. 206

ARROWHEAD GRAYBURG UNIT FIELD

GRAYBURG (3781-3959 feet)

Core Laboratories 11-10-95

Vertical Scale
5.00 in = 100.0 ft



; Pool ARROWHEAD GRBG Operator Chevron USA Inc. ~~ATLANTIC RICHFIELD COMPANY~~

Lease ~~ST. 157 D~~ Arrowhead Grayburg Ut Well No. ~~+~~ 206 Unit L S 12 T 22 R 36

DATE OF TEST	Daily Allowable	PRODUCED DURING TEST			Gas-Oil Ratio	Packer Leakage Field
		Water, Bbls.	Oil, Bbls.	Gas, MCF		
11-89 24	M	18	16	18	1125	
5-90 24	M	15	11	12	1091	
3-91 24	M	78	8	28	3500	

Pool ARROWHEAD GRAYBURG Operator ~~Atlantic Richfield Company~~ ARCO

Lease State 157-D Well No. 1 Unit L S 12 T 22 R 36

DATE OF TEST		Daily Allowable	PRODUCED DURING TEST			Gas-Oil Ratio	Packer Leakage Field
			Water, Bbls.	Oil, Bbls.	Gas, MCF		
9-2-70	24	9	12	9	4	444	
9-3-71	24	9	9	8	10	1225	
10-27-72	24	8	1	10	12	1164	
9-1-73	24	10	3	10	2	200	
9-15-74	24	10	5	10	5	500	
9-11-25	24	10	4	9	8	889	
6-22-76	24	9	4	10	3	300	
9-22-76	24	10	4	10	1	100	
9-24-77	24	10	4	10	1	100	
10-18-78	24	10	6	10	1	100	
9-15-79	24	10	3	10	6	1200	
9-5-80	24	10	4	5	0	0	
6-5-81	24	5	3	10	5	625	
9-4-81	24	10	3	8	3	375	
9-3-82	24	8	12	8	3	375	
9-3-83	24	8	2	5	2	400	
9-3-84	24	8	2	8	1	125	
2-16-85	24	5	1	5	1	125	
10-19-85	24	8	32	26	23	885	
10-18-86	24	8	4	8	5	625	
9-13-86	24	8	6	21	23	1095	
1-3-87	24	21	34	16	19	1187	
10-11-87	24	16	16	16	9	562	
9-20-88	24						

Pool ARROWHEAD Operator Atlantic Richfield Company ~~SINCLAIR OIL & GAS COMPANY~~

Lease St. 157 D Well No. 1 Unit L S 12 T 22 R 36

DATE OF TEST		DAILY ALLOWABLE	PRODUCED DURING TEST			GAS OIL RATIO
			WATER, BBLS.	OIL, BBLS.	GAS, MCF	
Feb. 10, 1951	24 hrs.	20	2.4	4.6	16.9	3674
1-22-52		20	12.8	6.8	27.3	4014
~~12-53~~	~~24 hrs.~~	10	30	10	39.78	3978
12-22-54	24 hrs.	10	14	7	39.7	5660
11-4-55	24 hrs.	7	32	6	39.4	3570
9-24-56	24 hrs	6	17	4	38.2	6,366
9-16-57	24 hrs.	4	18	4	19.6	4900
4-8-58	24 hrs.	4	5	8	113.1	14137
9-3-58	24 hrs	8	6	6	98.9	16433
9-10-59	"	5	16	5	189	37,800
6-6-60	24	3	8	3	116	38667
7-26-61	24	3	46	3	111	37000
8-3-62	24	3	12	3	118	39333
9-2-63	24	3	30	4	126	31500
10-24-64	24	4	20	3	92	30666
9-25-65	24	3	9	3	29	9570
10-16-66	24	3	0	2	61	30500
10-16-67	24	2	0	2	60	30000
6-9-68	—	3	20	9	248	23111
10-14-68	24	9	20	9	60	6667
9-3-69	24	9	2	10	6	600