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BODCAU IN SITU COMBUSTION PROJECT
PRESSURE TRANSIENT TESTING

Topical Report of January 1978

Date Published—February 1980

Work Performed for the Department of Energy
Under Contract EY-76-C-03-1189

MASTER

Cities Service Company
Tulsa, Oklahoma

U. S. DEPARTMENT OF ENERGY

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**BODCAU IN SITU COMBUSTION PROJECT
PRESSURE TRANSIENT TESTING**

Topical Report

by

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January 1978

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SUMMARY

During 1976 and 1977, extensive pressure transient testing was conducted in the five patterns of the Bodcau In Situ Combustion Project,¹ Bellevue Field, Louisiana. Pressure falloff tests were conducted prior to ignition² in August and September, 1976, and again in February, 1977. Pulse tests were conducted simultaneously with the falloff tests in February.

The objectives of the falloff tests were to determine the injection wellbore conditions and pattern flow capacities and to determine how or if the burning process affects them. Pulse tests were conducted to determine directional permeabilities within patterns in order to assist in predicting the combustion front movement.

The tests were conducted by shutting off injection into the central injector and subsequently monitoring the tubinghead pressure at that injector, as well as the gas production rates at the offset producing wells. Injection was then restarted and the offset wells' gas production monitored until it was near the initial rate.

Analysis of the falloff tests indicates that the advance of the firefront results in large increases in the formation flow capacity and average permeability around the injection wells. Pulse test analysis, on

¹Little, Tracy, P., Bodcau Insitu Combustion Project Precontract Work and Plan for Project Development, Cities Service Oil Company Topical Report.

²Joseph, Conrad, Bodcau Insitu Combustion Project, "Ignition", Cities Service Oil Company Topical Report.

the other hand, is not so simply understood. The dip of the formation is responsible for generally higher gas mobility (low lag times) toward the south. However, notable deviation occurs in certain patterns due to local anomalies in rock character, saturations and even possibly dip. The lag time measurements on each well defines its particular degree of "connectedness" to the offset injector. These lag times should be directly connected to the time required for breakthrough of the firefront at that well.

While local variations in reservoir properties must be considered in looking at the behavior of a particular well, the overall average behavior should be considered when selecting pattern configuration. The generally increased gas flow toward the south, previously mentioned, indicates that elongation of the patterns toward the south was indeed justified even though some premature breakthrough toward the north will occur due to local variations in geology.

INTRODUCTION

Between August 7 and September 24, 1976, the five patterns of the Bodcau In Situ Combustion Project (Figure 1) were ignited. Air injection rates were gradually increased from the initial rate of 200 MCFD to approximately 1,500 MCFD per pattern.

Pulse and falloff testing were used in the past to determine characteristics of individual patterns in Cities Service Company's two pilots. Effective pattern permeability to air and flow capacity plus wellbore condition are obtained from falloff tests. Pulse tests are used to determine directional permeability to air. These parameters are necessary to predict combustion front movement within the patterns.

The procedures and equipment involved in these tests are simple and inexpensive. Figure 2 shows a schematic of the equipment setup for the two tests.

DISCUSSION

Falloff Testing:

Preignition falloff tests conducted during August and September of 1976 determined the pattern effective permeabilities to air, flow capacities and individual injection wellbore conditions prior to any combustion. Tests conducted in February, 1977, show the effects of five months of burning upon the effective permeability to air and flow capacity.

These tests involved shutting in each injection well and recording the wellhead pressures for a period of two to five hours with an Ashcroft test gauge. Conventional analysis determined flow capacity, effective permeability to air and skin factor. Pattern 12 had an effective permeability to air of 14.5 md, and a flow capacity of 897 md-ft and well 12-1 showed a skin factor of -0.3, essentially undamaged. Pattern 13 had an effective permeability to air of 12 md, a flow capacity of 761 md-ft and well 13-1 showed stimulation with a skin factor of -3.4. Pattern 14 appeared to be the poorest pattern in terms of permeability to air and flow capacity. The values determined were 6 md and 320 md-ft, respectively. Well 14-1 was slightly stimulated with a skin factor of -2.5. Pattern 15 was much like patterns 12 and 13. Effective permeability to air was 14 md with a flow capacity of 594 md-ft. Well 15-1 also appeared slightly stimulated with a skin factor of -2.4.

Two preignition falloffs were run in pattern 16 because of delays in moving equipment for ignition from well 15-1 to 16-1. The first test, on August 20, 1976, yielded values of 32 md, 1338 md-ft and -0.2 for effective permeability to air, flow capacity and skin factor, respectively. The 32 md can be attributed to higher water saturation in pattern 16. The water, being more mobile than the heavy 19° API crude provides less resistance to the injection of air. The second test, conducted on September 21, 1976, yielded values of 82 md, 3434 md-ft and +0.9. There was no change, essentially, in wellbore conditions but because of continued injection the permeability to air was increased by a factor of 2.6. Figures 3 through 8 are the plots and calculations for the preignition tests. Results are summarized in Table I.

Approximately 1,132,800 MCF of air had been injected into the five patterns by March 1, 1977. A second set of falloff tests was performed to describe changes due to increased gas saturation in the patterns and combustion.

Pattern 12 showed increases to 136 md and 8418 md-ft with a skin factor of -5.3 as a result of the combustion and continued air injection. Pattern 13 improved to 210 md and 12,828 md-ft. The skin factor for well 13-1 had increased to +2.3 indicating some damage or blockage due to the ignition or other later developments. Pattern 14 had a permeability of 112 md and flow capacity of 6038 md-ft with well 14-1 showing a skin factor of -1.9. The values determined for pattern 15 were 192 md, 8459 md-ft and -3.2 for permeability, flow capacity and skin, respectively. Pattern 16 had a permeability to air of 544 md, a flow capacity of 22862 md-ft and well 16-1 had a skin factor of -3.3. Figures 9 through 13 present the plots and calculations while Table II summarizes the results for the second set of falloff tests.

The combined effect of the burned zone and the increased gas saturation in the unburned portion of the five patterns was to increase the effective permeability to air and flow capacity by a factor of 15.

Pulse Testing:

Pulse tests were conducted in February, 1977, to determine directional permeabilities to air within the five patterns. Pulse testing is frequently used in the field to determine formation characteristics and anomalies. The procedure used in the Bellevue Field was to first establish a stable air injection rate. The injector was then shut in for five hours and the response to the shut in pulse was monitored at offset producers. Air was then reinjected at the previous rate. Monitoring of response continued until all wells had responded to the reinjection. A typical response curve is shown in Figure 14. The response was measured in terms of gas flow rates rather than bottomhole pressure as in the classical method. In Bellevue it would not be practical to monitor pressure responses in so many low pressure, shallow pumping wells.

Water manometers were connected to the exhaust gas flow lines at each producing well in the pattern tested (Figure 2). Readings were taken during the stabilized injection period for 15 hours prior to the start of the test. Data gathering continued throughout the entire test period.

Produced gas flow rates decreased after the injectors were shut in. Although air injection was resumed, gas production rates continued to decrease for a period of time before they finally started to increase. The time lag from reinjection time to response time at the producers was used to calculate the directional permeability to air. The general equation used is given by:

$$(t_{DL} + 1) t_{DL} \ln \left(1 + \frac{1}{t_{DL}} \right) = \frac{r^2}{4\eta\Delta t}$$

$$\text{where } \eta = \frac{0.00633K}{1440 \phi \mu c}$$

$$t_{DL} = \frac{t_L}{\Delta t}$$

t_L = Time lag in minutes

Δt = Shut in time in minutes

Figures 15 through 23 show the responses of wells in pattern 12. Directional permeabilities to air in pattern 12 ranged from a minimum of 26 md towards well 12-3 to a maximum of 278 md towards well 2-8. Generally, the permeabilities were higher to wells along the south boundary of the pattern. The geometric mean pattern permeability to air was calculated at 141 md (Figure 56).

Response to the pulse in pattern 13 is shown in Figures 25 through 32. The maximum permeability to air was towards well 13-6. The 413 md was the highest value measured in the project area. The minimum permeability to air in the pattern was 42 md towards 13-3 and the geometric mean was determined as 124 md (Figure 57).

Pattern 14 response curves are shown as Figures 34 through 41. This pattern had a maximum effective permeability to air of 190 md towards well 14-6, a minimum of 26 md towards well 14-4 and a geometric mean of 65 md (Figure 58).

Figures 43 through 50 show the responses of wells in pattern 15. Permeabilities to air ranged from 170 md towards well 15-6 to 33 md towards well 14-3. The geometric mean for the pattern was 75 md (Figure 59).

The response curves for pattern 16 are shown as Figures 52 through 59. The pattern had a geometric mean effective permeability to air of 62 md with a maximum of 235 md towards well 16-6 and a minimum of 27 md towards well 16-2 (Figure 60).

The data from the test and effective permeabilities to air which were calculated are summarized in Table III. These results indicated much greater permeability to air in the southern half of the patterns. This is shown in Figure 61 (directional K versus direction). Wells with the higher permeabilities to air are also farther from the injectors. For this reason, a plot of directional permeability versus the square of distance was made. Figure 62 shows the correlation between calculated permeability to air and distance.

Another approach was to determine the characteristic time lag (Δt_l) in different directions. The characteristic time lag is a function of shut in time and the measured time lag and indicates the degree of connectedness between producer and injector. Thus, it should relate the channeling tendencies within the patterns.

The characteristic time lag values determined for pattern 12 range from a maximum of 3451 minutes towards well 12-3 to a minimum of 739 minutes towards wells 2-5 and 2-8. Generally, the wells south of the injector had

lower time lags than wells north of the injector. The primary axis for fluid movement is north-south (Figure 63).

Pattern 13 exhibited a somewhat greater channeling tendency along its north-south axis than any of the other patterns (Figure 64). The minimum value of 317 minutes was to well 13-2 (north) while the maximum was 2173 towards well 13-3 (northeast).

The values determined for pattern 14 were generally greater than in the other four patterns (Figure 65). The minimum time lag was 842 minutes towards well 14-6 (south) while the maximum was 2590 minutes towards well 13-3 (northwest).

Pattern 15 (Figure 66) was very similar to pattern 14 except that the minimum time of 739 minutes was towards the north well, 15-2. The maximum time of 2919 minutes was to the northwest, 14-3.

In pattern 16 (Figure 67) two wells were not analyzable, but the data gathered indicate, again, the north-south axis of minimum diffusion time. The time lag towards well 16-6 was 516 minutes while towards well 15-3 it was 3818 minutes.

The values determined for the characteristic time lag in all patterns are also summarized in Table III with the directional permeability values. Unlike directional permeability, characteristic lag time showed no correlation with distance (Figure 68). Generally, Δt_l was much smaller along a north-south axis than any other directions. This suggests that the combustion front should preferentially elongate along a north-south axis within each pattern. Since the time lags were also shorter, generally, to the south than north the combustion front should also expand more readily to the south, or updip.

TABLE I
SUMMARY OF PREIGNITION FALLOFF TESTS
DATE: AUGUST, 1976

<u>Pattern</u>	<u>Kgh, Md-ft</u>	<u>Kg, md</u>	<u>Skin Factor, S</u>
12	897	14	-.3
13	761	12	-3.4
14	320	6	-2.5
15	594	14	-2.4
16	1338	32	-0.2
16(a)	3434	82	+0.9

TABLE II
SUMMARY OF SECOND FALLOFF TESTS
DATE: FEBRUARY, 1977

<u>Pattern</u>	<u>Kgh, Md-ft</u>	<u>Kg, md</u>	<u>Skin Factor, S</u>
12	8418	136	-5.3
13	12828	210	2.3
14	6038	112	-1.9
15	8459	192	-4.1
16	22862	544	-3.3

TABLE III
RESULTS OF PULSE TEST ANALYSIS
DATE: JANUARY 31, 1977 - FEBRUARY 10, 1977

Pattern	Well	q [MMSCFD]	r (Ft.)	t _L [Min.]	Δt ₁ , [Min.]	K _g (md)
				Feb. 1977	Feb. 1977	Feb. 1977
12	12-2	0.456	165	200	1222	37
	12-3	0.379	233	730	3451	26
	12-4	0.258	175	120	842	61
	12-5	0.273	351	180	1130	182
	12-6	0.190	310	160	1036	155
	2-8	0.218	351	100	739	278
	2-5	0.208	233	100	739	122
	2-4	0.092	170	220	1312	37
	2-3	0.061	233	220	1312	69
	12-1	1.5	Shutin Time = 300 Minutes			
	12-3	0.379	233	148	979	92
13	12-4	0.258	178	92	697	76
	12-5	0.273	355	148	979	215
	13-6	0.170	310	40	383	413
	13-5	0.110	355	80	632	332
	13-4	0.110	178	185	1153	46
	13-3	0.277	233	420	2173	42
	13-2	0.097	165	30	317	143
	13-1	1.6	Shutin Time = 300 Minutes			
	13-4	0.110	170	180	1129	43
	13-5	0.110	345	180	1129	176
	14-6	0.098	310	120	842	190
14	14-5	0.154	360	420	2173	99
	14-4	0.183	195	480	2423	26
	14-3	0.240	230	220	1312	67
	14-2	0.120	165	180	1129	40
	13-3	0.277	215	520	2590	30
	14-1	1.3	Shutin Time = 300 Minutes			
	14-3	0.183	240	600	2919	33
	14-4	0.129	200	320	1749	38
	14-5	0.170	355	300	1663	126

TABLE III - (Continued)

<u>Pattern</u>	<u>Well</u>	<u>q [MMSCFD]</u>	<u>r (Ft.)</u>	<u>t_L [Min.]</u> <u>Feb. 1977</u>	<u>Δt₁, [Min.]</u> <u>Feb. 1977</u>	<u>K_g (md)</u> <u>Feb. 1977</u>
16	15-6	0.183	310	140	940	170
	15-5	0.110	370	280	1577	145
	15-4	0.289	200	240	1401	48
	15-3	0.395	215	120	842	92
	15-2	0.839	160	100	739	58
	15-1	1.57	Shutin Time = 300 Minutes			
	16-2	0.273	145	220	1312	27
	16-3	0.146	260	Not Analyzable		
	16-4	0.146	225	160	1036	81
	16-5	0.051	345	Not Analyzable		
	16-6	0.269	270	60	516	235
	15-5	0.098	340	520	2672	46
	15-4	0.281	220	420	2173	49
	15-3	0.395	320	820	3818	45
	16-1	1.4				

FIGURE 1

**BODCAU INSITU COMBUSTION
PROJECT PATTERN MAP**

FIGURE 2
TEST SCHEMATIC

FIGURE 3

FALLOFF TEST #1

WELL 12-1

AUGUST 3, 1976

FIGURE 4

FIGURE 5

FIGURE 6

FIGURE 7

FIGURE 8

19

FIGURE 9

FIGURE 10

FIGURE 11

FIGURE 12

FIGURE 13

FIGURE 14
TYPICAL INTERFERENCE RESPONSE
PATTERN 14 WELL 14-5

FIGURE 15
INTERFERENCE TEST
PATTERN 12, WELL 2-3

FIGURE 16
INTERFERENCE TEST
PATTERN 12, WELL 2-4

FIGURE 17
INTERFERENCE TEST
PATTERN 12, WELL 2-5

FIGURE 18
INTERFERENCE TEST
PATTERN 12, WELL 2-8

FIGURE 19
INTERFERENCE TEST
PATTERN 12, WELL 12-2

FIGURE 20
INTERFERENCE TEST
PATTERN 12, WELL 12-3

FIGURE 21
INTERFERENCE TEST
PATTERN 12 WELL 12-4

FIGURE 22
INTERFERENCE TEST
PATTERN 12, WELL 12-5

FIGURE 23
INTERFERENCE TEST
PATTERN 12, WELL 12-6

FIGURE 24
INTERFERENCE TEST
PATTERN 13, WELL 12-3

FIGURE 25
INTERFERENCE TEST
PATTERN 13 WELL 12-4

FIGURE 26
INTERFERENCE TEST
PATTERN 13, WELL 12-5

FIGURE 27
INTERFERENCE TEST
PATTERN 13, WELL 13-2

FIGURE 28
INTERFERENCE TEST
PATTERN 13, WELL 13-3

FIGURE 29
INTERFERENCE TEST
PATTERN 13, WELL 13-4

FIGURE 30
INTERFERENCE TEST
PATTERN 13, WELL 13-5

FIGURE 31
INTERFERENCE TEST
PATTERN 13, WELL 13-6

FIGURE 32
INTERFERENCE TEST
PATTERN 14, WELL 13-3

FIGURE 33
INTERFERENCE TEST
PATTERN 14, WELL 13-4

FIGURE 34
INTERFERENCE TEST
PATTERN 14, WELL 13-5

FIGURE 35
INTERFERENCE TEST
PATTERN 14, WELL 14-2

FIGURE 36
INTERFERENCE TEST
PATTERN 14, WELL 14-3

FIGURE 37
INTERFERENCE TEST
PATTERN 14, WELL 14-4

FIGURE 38
INTERFERENCE TEST
PATTERN 14, WELL 14-5

FIGURE 39
INTERFERENCE TEST
PATTERN 14, WELL 14-6

FIGURE 40
INTERFERENCE TEST
PATTERN 15, WELL 14-3

FIGURE 41
INTERFERENCE TEST
PATTERN 15, WELL 14-4

FIGURE 42
INTERFERENCE TEST
PATTERN 15, WELL 14-5

FIGURE 43
INTERFERENCE TEST
PATTERN 15, WELL 15-2

FIGURE 44
INTERFERENCE TEST
PATTERN 15, WELL 15-3

FIGURE 45
INTERFERENCE TEST
PATTERN 15, WELL 15-4

FIGURE 46
INTERFERENCE TEST
PATTERN 15, WELL 15-5

FIGURE 47
INTERFERENCE TEST
PATTERN 15, WELL 15-6

FIGURE 48
INTERFERENCE TEST
PATTERN 16, WELL 15-3

FIGURE 49
INTERFERENCE TEST
PATTERN 16, WELL 15-4

FIGURE 50
INTERFERENCE TEST
PATTERN 16, WELL 15-5

FIGURE 51
INTERFERENCE TEST
PATTERN 16, WELL 16-2

FIGURE 52
INTERFERENCE TEST
PATTERN 16, WELL 16-3

FIGURE 53
INTERFERENCE TEST
PATTERN 16, WELL 16-4

FIGURE 54
INTERFERENCE TEST
PATTERN 16, WELL 16-5

FIGURE 55
INTERFERENCE TEST
PATTERN 16, WELL 16-6

FIGURE 56
**DIRECTIONAL PERMEABILITY TO AIR
PATTERN 12**

○
2-3

○
12-2

○
12-3

○
2-4

○
12-4

○
2-5

○
2-8

○
12-6

○
12-5

FIGURE 57
**DIRECTIONAL PERMEABILITY TO AIR
PATTERN 13**

○
12-3

○
13-2

○
13-3

○
12-4

○
13-4

○
12-5

○
13-6

○
13-5

FIGURE 58
**DIRECTIONAL PERMEABILITY TO AIR
PATTERN 14**

○
13-3

○
14-2

○
14-3

○
13-4

○
14-4

○
13-5

○
14-6

69

○
14-5

FIGURE 59

DIRECTIONAL PERMEABILITY TO AIR PATTERN 15

○
14-3

○
15-2

○
15-3

○
14-4

○
15-4

○
14-5

○
15-6
70

○
15-5

FIGURE 60
**DIRECTIONAL PERMEABILITY TO AIR
PATTERN 16**

○
15-3

○
16-2

○
16-3

○
15-4

○
16-4

○
15-5

○
16-6

○
16-5

FIGURE 61
PERMEABILITY TO AIR
VS.
DIRECTION

FIGURE 62
DIRECTIONAL PERMEABILITY VS. r^2

FIGURE 63
**CHARACTERISTIC TIME LAG, Δt ,
 PATTERN 12**

FIGURE 64
CHARACTERISTIC TIME LAG, Δt ,
PATTERN 13

FIGURE 65

CHARACTERISTIC TIME LAG, Δt_1 PATTERN 14

FIGURE 66
CHARACTERISTIC TIME LAG, Δt_1
PATTERN 15

14-5

15-6 77

15-5

FIGURE 67

CHARACTERISTIC TIME LAG, Δt , PATTERN 16

FIGURE 68
CHARACTERISTIC TIME LAG VS. r^2

INTERFERENCE DATA
PATTERN 12 WELL 2-3
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 1FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1095	66.8	2284	58.5
1149	62.5	2313	57.9
1203	62.3	2343	58
1270	62.7	2371	57.6
1334	62.8	2410	57.4
1392	62.8	2434	57.3
1465	62.8	2465	57
1517	62.7	2495	57
1630	64.2	2523	56.8
1753	62.7	2552	56.9
1872	62.8	2583	56.9
1926	62.7	2544	57.1
1953	62.6	2710	57.5
1938	62.6	2764	57.6
1993	62.4	2828	58
2016	62.4	2884	58.3
2040	62.2	2948	60.5
2048	62.2	3006	61
2076	62	3068	62
2103	64.6	3137	60
2134	64.2	3191	62.5
2162	64.6	3254	65.8
2193	64	3309	60.5
2220	63.2	3402	62.4
2249	58.8		

INTERFERENCE DATA
PATTERN 12 WELL 2-4
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 1FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1098	74	2283	67.4
1147	73.1	2312	66.2
1201	73.3	2341	65.6
1268	73.4	2370	66.2
1332	74.3	2408	65.4
1390	74.4	2433	65
1460	73.4	2464	66.4
1515	73.3	2494	66
1625	73	2521	65.5
1750	74.2	2551	65.3
1870	72.8	2582	65.5
1925	74.1	2644	65.7
1952	73.9	2705	64.5
1979	73.4	2762	64.7
1992	73.6	2825	65.8
2015	73.9	2882	66
2039	74.3	2945	68.2
2047	73.8	3004	68
2074	73.1	3065	68.8
2102	72.2	3135	69.2
2132	71	3189	69.7
2160	70.4	3252	70.8
2192	72	3308	70.5
2219	69.8	3400	71.9
2248	70.8	3484	69.8

INTERFERENCE DATA
PATTERN 12 WELL 2-5
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 1FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1113	76.5	2280	74.8
1144	76.2	2311	74.9
1199	76.4	2340	75.4
1263	76.5	2369	74.8
1330	76.8	2406	76.1
1388	75.8	2431	74.5
1455	76.7	2463	75.4
1510	76.5	2491	75.8
1620	76.3	2520	75.7
1740	76.7	2550	75.5
1867	76.2	2580	75.8
1924	76.1	2640	75
1950	76.2	2700	76.4
1978	76.1	2760	76.3
1991	77.2	2820	76.4
2014	76.4	2880	76
2037	75.2	2941	75.5
2046	75.5	3000	76.5
2072	76.3	3061	76.3
2101	75	3130	76.6
2131	77.4	3185	76.7
2159	75.1	3250	76.7
2190	75.2	3305	76.7
2218	74.9	3398	76.4
2246	75.5	3483	75.8

INTERFERENCE DATA
PATTERN 12 WELL 2-8
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 1FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1108	87	2319	85.4
1158	86.6	2352	85.2
1210	86.9	2377	85.2
1290	87	2418	86
1344	86.7	2443	85.6
1400	86.8	2472	86
1475	86.8	2504	85.9
1645	87.5	2531	85.9
1770	87.7	2559	85.7
1881	87.7	589	85.9
1938	88.4	2662	86.2
1961	88.5	2721	86.5
1987	98.1	2780	86.6
2001	88.9	2840	86.8
2021	88.3	2895	87
2035	88.2	2961	87.8
2053	88.4	3018	88
2084	87.5	3081	88.2
2112	87.6	3150	88.3
2142	87.6	3205	88.3
2171	87.3	3270	88.4
2201	86.8	3320	88.5
2230	86	3411	88.9
2257	86.4		
2282	85.7		

INTERFERENCE DATA
PATTERN 12 WELL 12-2
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 1FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1100	76.5	2252	72
1151	77.8	2285	70.3
1204	77.7	2314	69.4
1276	77.4	2345	68.7
1336	77.6	2372	68.9
1394	77.6	2411	69.1
1466	78.8	2436	69.1
1520	78.9	2466	69
1635	78.8	2497	69.4
1757	79.1	2524	70.3
1928	62.5	2553	71.2
1929	80.5	2584	72.3
1947	82.4	2646	74.4
1954	82.8	2712	74.6
1982	83.2	2766	76.5
1995	82.6	2830	79.2
2017	82.8	2886	79.1
2028	81.7	2950	82.2
2049	81.3	3008	84.8
2077	79.7	3071	83.5
2106	78.5	3139	84.2
2137	76.8	3193	84.7
2163	74.7	3258	87.7
2196	74.5	3310	87.7
2224	72.5	3405	86.7

INTERFERENCE DATA
PATTERN 12 WELL 12-3
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 1FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1101	77.7	2287	81.9
1152	77.3	2315	81.3
205	78	2346	81.5
1280	77.7	2373	81.1
1333	77.8	2413	81.5
1395	77.8	2437	80.2
1468	78	2467	80.4
1522	78	2498	80
1637	78.2	2525	78.7
1761	78.3	2554	78
1875	78.9	2586	76.9
1933	80.5	2648	74.2
1955	80.4	2714	71.5
1983	80.7	2768	69.8
1996	81.4	2832	68.2
2018	81.2	2888	67.9
2031	81.3	2952	66.7
2049	81.3	3010	67.2
2079	81.5	3073	68.3
2107	81	3141	67.8
2139	81.6	3195	67.8
2165	82	3262	68.7
2197	81.9	3312	66.7
2225	82.2	3407	66.6
2253	82.3	3487	65.8

INTERFERENCE DATA
PATTERN 12 WELL 12-4
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 1FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1103	84.4	2288	77.4
1154	84.6	2316	77.2
1207	84.7	2349	77.2
1284	84.6	2375	77.6
1340	84.7	2414	77.6
1396	84.8	2433	77.5
1470	84.8	2468	77.6
1524	84.8	2499	77.9
1640	84.8	2529	78
1765	85.2	2557	78.4
1877	85.1	2587	78.2
1935	85.5	2652	79.6
1956	85.6	2715	80.9
1984	85.6	2770	82.3
1998	85.9	2835	84.1
2019	85.6	2890	85.3
2032	85.8	2954	86.2
2050	85.5	3012	86.5
2080	85.4	3075	87.2
2108	83	3144	88
2139	82.2	3198	89.1
2167	81.7	3264	89.7
2198	80.3	3314	89.3
2227	79	3408	89.8
2254	79	3492	90.8

INTERFERENCE DATA
PATTERN 12 WELL 12-5
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 1FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1105	75.9	2289	72.4
1155	75.7	2317	71.8
208	75.7	2350	71.8
1287	75.6	2376	71.7
1341	75.6	2416	71.7
1398	75.8	2440	71
1472	75.8	2470	71.2
1526	75.7	2501	71.1
1642	75.7	2530	71.3
1768	75.7	2558	71.5
1878	75.8	2588	71.5
1936	76	2658	71.7
1957	76.1	2717	71.9
1985	76.1	2774	72.7
1999	76.4	2837	73.2
2020	76.4	2892	73.6
2032	76.3	2956	74.2
2051	76	3014	74.6
2081	75.5	3077	75.1
2109	75	3146	75.5
2140	74.7	3201	75.8
2163	74	3263	76.1
2199	73.5	3316	76.2
2228	73.2	3409	76.9
2255	72.9	3493	76.9

INTERFERENCE DATA
PATTERN 12 WELL 12-6
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 1FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1107	92	2318	88.5
1157	91.9	2351	88.2
1209	91.9	2376	87.9
1289	91.9	2417	88
1342	92	2442	88
1399	91.9	2471	88.1
1474	92	2503	88.2
1644	92.1	2530	87.8
1769	92.3	2558	88.3
1880	92.2	2588	88.6
1937	92.8	2660	89.1
1960	92.9	2719	89.4
1936	93	2777	90.1
2000	93.1	2839	90.8
2020	93.1	2844	91.1
2034	93.2	2959	91.9
2052	93.1	3016	92.3
2082	92.5	3079	92.8
2110	92.4	3148	93.2
2141	92	3203	93.6
2170	91.1	3268	94.1
2200	90.6	3318	94.3
2230	90	3410	94.5
2257	89.6	3494	95
2291	89.1		

INTERFERENCE DATA
PATTERN 13 WELL 12-3
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 3FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
845	78	2336	71.6
927	86.5	2365	72.1
1004	76	2398	72
1063	77.5	2427	72
1162	79.7	2456	72.4
1270	79.5	2485	72.7
1350	79.4	2518	72
1424	79.5	2586	72.4
1530	79.3	2642	72.7
1665	80.3	2700	74.5
1832	80.4	2762	75.2
1924	79.8	2820	75.2
1983	80.8	2880	76.6
1996	81.1	2942	77.4
2011	80.3	3002	77
2026	80.8	3067	76.2
2070	79	3120	77.9
2101	78.5	3183	77
2130	77.2	3242	78
2160	76.9		
2190	76		
2220	75		
2248	73.7		
2288	73		
2308	72		

INTERFERENCE DATA
PATTERN 13 WELL 12-4
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 3FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
855	86.7	2342	73
932	86	2372	72.5
1014	84.4	2403	73.1
1068	83.8	2435	73.3
1171	82.6	2461	73.3
1279	82	2493	74.1
1357	81.8	2525	74.5
1432	81.8	2593	74.9
1542	81.5	2647	75.1
1673	81.8	2705	76
1842	81.1	2770	76.7
1928	82.5	2826	76.8
1989	81.8	2887	77.8
2004	82.6	2947	78.2
2017	82.5	3008	78.7
2032	82.2	3071	78.9
2075	81.3	3125	78.5
2106	80.1	3191	79.5
2141	78.5	3250	79.7
2167	78.2		
2196	76		
2227	75.6		
2253	74.6		
2293	73.5		
2314	73.2		

INTERFERENCE DATA
PATTERN 13 WELL 12-5
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 3FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
855	79.8	2346	71.4
938	79.2	2375	71.6
1015	78.8	2408	71.4
1073	78.5	2441	71.4
1178	77.5	2467	71.5
1285	77.4	2499	71.5
1365	77.2	2530	71.8
1438	77.2	2598	72
1545	77.3	2652	72.5
1679	77.1	2710	73
1848	77	2776	73.8
1929	77.1	2830	74.1
1994	77.2	2892	74.8
2009	77.2	2952	75.2
2023	77.3	3014	75.5
2036	77.5	3076	75.8
2078	76.9	3129	75.6
2110	76	3196	75.9
2140	75.2	3255	75.8
2173	74.4		
2201	73.6		
2231	73.1		
2258	72.5		
2299	72		
2319	71.7		

INTERFERENCE DATA
PATTERN 13 WELL 13-2
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 3FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
826	78.5	2337	63
928	78.2	2367	63.7
1006	76.8	2400	64.1
1064	76.4	2429	63.8
1164	75.8	2458	64.2
1272	75.5	2487	64.7
1352	75.2	2520	65.2
1426	75.5	2588	67
1535	75	2643	66.9
1667	74.4	2701	68.1
1834	75	2764	68
1925	73.5	2821	68.8
1985	76.1	2882	70.7
1999	75	2943	70.6
2013	74.6	3002	71.5
2028	74	3064	71.5
2071	72	3121	70.6
2103	70.3	3085	72
2131	67.1	3243	74.1
2162	65.9		
2192	64.6		
2222	64		
2250	64.3		
2290	63		
2310	63		

INTERFERENCE DATA
PATTERN 13 WELL 13-3
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 3FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
830	89.2	2338	84.1
930	91	2368	83.5
1008	93	2401	83
1065	89.5	2431	81
1166	89.4	2459	82.1
1274	87.5	2489	82
1353	87.5	2521	82.1
1428	87.5	2589	81.3
1536	87.5	2644	81.1
1668	88	2702	81.2
1837	86.1	2766	80.8
1926	87.2	2822	82
1986	87.3	2883	81.5
2001	88.4	2944	81.9
2014	87.4	3004	82.5
2029	88.3	3066	82.2
2072	88.3	3122	83.7
2104	88	3187	84
2132	87	3245	83.7
2164	86.9		
2193	87.3		
2224	85		
2251	85		
2291	84		
2311	83.2		

INTERFERENCE DATA
PATTERN 13 WELL 13-4
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 3FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
847	73.8	2340	70.8
931	73.8	2370	71
1012	73.8	2402	70.5
1067	73	2433	71.3
1168	73	2460	71.6
1277	72	2491	71.8
1345	72.2	2523	71
1431	72.4	2592	70.8
1540	72.4	2646	70.2
1671	71.8	2704	71.5
1840	72.3	2768	71.2
1933	73.2	2824	71.5
1988	72.3	2885	71.7
2003	72.3	2946	72.1
2016	72.5	3007	72.1
2030	72.5	3070	71.9
2073	73.1	3124	71.8
2105	72.8	3189	72.2
2134	73	3248	72.4
2166	72.9		
2195	72		
2225	71.5		
2252	71.7		
2292	70.6		
2313	70.5		

INTERFERENCE DATA
PATTERN 13 WELL 13-5
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 3FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
850	78	2344	73.4
936	78.3	2373	73.5
1016	77	2405	74.2
70	76.7	2438	74.1
1173	76.9	2464	74.1
1282	76.5	2495	74
1360	77	2527	74.1
1435	76.9	2595	74.1
1545	76	2649	74.6
1677	76.2	2707	76.2
1845	76.6	2773	77
1930	77.7	2827	77.2
1992	76.8	2889	77.2
2006	76.7	2949	76.5
2020	76.5	3011	76.7
2034	77.3	3073	76.3
2076	77.5	3127	76.2
2108	77.5	3193	76.4
2137	76.8	3253	76.3
2170	76.7		
2198	76.5		
2229	76.7		
2256	76.4		
2296	74.7		
2317	74.7		

INTERFERENCE DATA
PATTERN 13 WELL 13-6
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 3FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
853	67.2	2363	58.5
937	66.7	2392	59
1018	66.4	2425	59.2
1072	66.2	2458	59.7
1177	65.5	2484	60
1283	65.5	2516	60.3
1362	65.5	2547	60.3
1437	65.5	2597	61.5
1544	65.6	2651	62
1675	65.7	2709	62.5
1847	65.6	2775	63
1931	65.8	2828	63
1993	65.7	2891	63.5
2008	65.7	2951	64
2022	65.5	3013	64.2
2035	65	3075	64.2
2077	63.7	3128	64.4
2109	62.4	3195	64.5
2139	62.1	3254	64.5
2172	61		
2200	60.2		
2230	59.5		
2257	58.7		
2298	57.9		
2336	58		

INTERFERENCE DATA
PATTERN 14 WELL 13-3
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 5FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1039	83.3	2436	79
1086	83.6	2462	79.8
1202	82.5	2493	79.3
1327	82.4	2525	77.8
1451	81.3	2554	76.5
1567	82.4	2615	77.3
1722	82.5	2670	77.2
1873	82.4	2731	77.1
1954	81.3	2791	75.8
1986	82.5	2850	77.2
2006	82.6	2910	76.2
2025	82.6	2970	77.6
2046	82.8	3040	76.8
2081	82.1	3090	78.4
2102	82.2	3165	78.7
2128	83	3210	78.1
2160	82	3275	79.4
2187	81.8	3338	80
2216	82.4	3427	79.7
2247	80.8		
2279	81.6		
2311	80.3		
2340	80.6		
2370	79.6		
2402	80		

INTERFERENCE DATA
PATTERN 14 WELL 13-4
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 5FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1050	75.1	2446	66
1095	77.1	2472	66.5
1217	78.5	2503	67.5
1337	77.3	2537	68.2
1462	79.3	2567	68.1
1581	77.2	2628	68.2
1739	72	2685	69.2
1884	77.3	2745	69.3
1966	78.4	2805	69.5
1995	77.9	2868	70.5
2014	77.8	2927	71.8
2033	78.1	2987	71.8
2053	78.1	3055	73.5
2089	76.1	3100	72.8
2111	75.3	3182	74.2
2136	74.9	3226	74.7
2168	73.8	3289	75.2
2196	72.8	3352	76.3
2225	71.1	3436	77.4
2257	70.8		
2293	69.9		
2318	68.8		
2348	68.2		
2386	67.7		
2413	66.8		

INTERFERENCE DATA
PATTERN 14 WELL 13-5
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 5FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1052	75.6	2449	70.7
1098	75.4	2476	70.8
1219	75.4	2507	70.8
1341	75.8	2541	71.4
1465	75.3	2572	72
1584	75.4	2634	72.5
1745	75.8	2691	72.5
1887	75.9	2749	72.8
1969	75.3	2808	73.5
1998	75.6	2871	75.2
2017	75.4	2931	75.5
2037	75.3	2990	75.8
2056	75.5	3060	75.5
2092	75.5	3110	75
2113	75.3	3190	74.5
2139	75	3230	74.5
2172	74.8	3292	74.4
2199	73.7	3355	74.6
2228	73.3	3440	74.4
2268	73		
2296	72.5		
2321	71.7		
2351	71.4		
2391	70.9		
2416	71.2		

INTERFERENCE DATA
PATTERN 14 WELL 14-2
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 5FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1041	87.9	2437	73.3
1089	87.6	2463	73
1203	87	2494	73.3
1329	86.9	2527	73.5
1452	86.8	2556	74.1
1568	86.7	2616	74.4
1725	86.6	2672	75.8
1875	86.4	2734	76.2
1958	86.2	2793	77
1988	86.2	2852	77.8
2009	86.2	2912	78.6
2026	86	2972	79.2
2047	85.4	3041	79.9
2084	83.8	3092	80.5
2104	82.8	3167	81.3
2129	81.5	3211	81.9
2161	80.5	3277	82.8
2188	79.4	3340	83.4
2217	78.2	3428	84.2
2249	76.9		
2281	76.1		
2312	74.9		
2341	74.1		
2371	73.7		
2403	73.3		

INTERFERENCE DATA
PATTERN 14 WELL 14-3
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 5FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1043	79.4	2439	71.6
1088	79.2	2465	71.2
1205	78.7	2496	71.1
1330	78.7	2529	71.1
1453	78.7	2558	71
1570	78.4	2618	71.2
1726	78.3	2676	71.7
1877	78.1	2737	72.1
1956	78.1	2797	72.6
1987	77.9	2856	73.1
2007	78	2913	73.5
2027	78	2973	73.8
2048	78	3042	74.1
2083	77.8	3092	74.4
2106	77.4	3168	74.6
2130	77	3212	74.8
2162	76.6	3278	75
2189	75.8		
2219	75.2		
2251	74.5		
2288	73.8		
2313	73.2		
2342	72.7		
2381	71.8		
2406	71.7		

INTERFERENCE DATA
PATTERN 14 WELL 14-4
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 5FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1045	83.3	2442	79.8
1091	83.7	2467	79.6
1208	83.2	2498	79.3
1332	82.8	2532	79.4
1456	84.1	2561	79
1574	84.3	2622	78.7
1732	83.7	2678	78.3
1879	83.5	2744	78.2
1958	83.3	2803	78.6
1989	83.7	2865	78.6
2010	83.9	2920	78.9
2029	84.2	2985	79.1
2049	84.2	3052	79.1
2086	84	3102	79.7
2107	83.6	3180	80.1
2132	83.6	3224	80.2
2164	83.7	3287	80.2
2190	83		
2220	82.8		
2254	82.4		
2289	81.6		
2315	81.2		
2344	81.1		
2382	79.4		
2408	79.9		

INTERFERENCE DATA
PATTERN 14 WELL 14-5
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 5FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1057	87.8	2453	84.5
1103	87.4	2480	84
1222	87.4	2512	84.2
1345	87.6	2546	84
1470	88.4	2576	84
1602	88.2	2637	83.8
1752	88.6	2697	83
1894	87.6	2755	83.8
1974	87.4	2815	84.8
2002	88.2	2877	85.4
2021	88.3	2922	85.6
2041	87.8	2982	86.6
2060	88	3050	85.4
2096	87.8	3100	86.1
2117	88.5	3178	85.8
2142	88.4	3221	86.3
2175	87.8	3285	86.2
2202	87.7	3360	86.8
2233	87.6	3444	87.5
2264	87.5		
2299	87.4		
2325	86.3		
2355	86.2		
2395	85.2		
2420	84.5		

INTERFERENCE DATA
PATTERN 14 WELL 14-6
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 5FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1047	79.8	2444	71.7
1094	78	2470	70.8
1212	78.2	2501	72
1335	78.8	2535	73
1460	77.9	2565	71.2
1577	77.3	2625	71.7
1735	77.6	2683	73.6
1882	77.3	2740	72.6
1962	77.5	2800	74.8
1991	78.3	2862	75.1
2012	78.8	2919	76
2032	78.4	2979	75.8
2052	77.5	3048	76
2088	76.7	3138	76.5
2109	76.3	3176	76.5
2135	76	3219	75.8
2166	74.8	3282	76.5
2194	75.6	3348	76
2223	74.1	3434	77.1
2256	73.6		
2291	73.3		
2317	73.4		
2346	73.8		
2384	70.5		
2411	71.5		

INTERFERENCE DATA
PATTERN 15 WELL 14-3
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 7FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1010	88.2	2474	85.6
1091	87.3	2493	85.3
1222	86.9	2512	85.3
1329	86.6	2534	85.1
1443	86.6	2568	84.7
1567	86.6	2588	84.6
1685	86.6	2620	84.2
1810	86.6	2652	84
1964	87.1	2680	83.5
2041	87.1	2718	83
2096	87.4	2767	82.2
2126	87.4	2830	81.5
2150	87.3	2887	81
2165	87.3	3010	81.4
2193	87.2	3128	81.2
2226	87.1	3242	82
2264	86.8	3374	82.7
2302	86.6	3448	83.2
2319	86.6		
2348	86.3		
2383	86.2		
2399	86.1		
2422	86		
2439	85.9		
2457	85.9		

INTERFERENCE DATA
PATTERN 15 WELL 14-4
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 7FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1008	86.2	2477	81
1089	85.2	2495	82
1224	84.2	2514	81.7
1331	85	2535	81
1445	84.55	2562	81
1569	84.2	2589	79.9
1688	86.2	2622	80.6
1812	85.5	2653	78
1962	85.3	2682	74.6
2040	86	2720	73.2
2093	86.3	2768	75.5
2130	86.5	2831	78.7
2151	86.5	2889	78
2166	85.5	3012	80
2194	86	3130	80.5
2228	85	3244	80.2
2265	86.4	3369	82.5
2303	85.6	3496	81.6
2320	85		
2350	84.3		
2378	82.5		
2399	82		
2423	83.5		
2440	84.2		
2459	81.3		

INTERFERENCE DATA
PATTERN 15 WELL 14-5
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 7FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1000	73.2	2463	63.2
1080	74.8	2481	62.8
1229	73.2	2498	62.8
1337	74.3	2522	62.6
1452	74.9	2552	62.3
1576	76.5	2597	61.3
1694	75.5	2628	62
1819	75.2	2659	62.2
1922	75.6	2688	62.1
2039	76.3	2726	62.2
2087	75.9	2774	62.7
2113	75.2	2838	63
2140	75.2	2895	64.4
2155	75	3019	66.3
2185	75	3136	72.7
2213	74.5	3250	76.8
2253	72.5	3360	76.7
2289	70.3	3420	77
2300	69.8		
2338	64.8		
2367	64.4		
2386	64.1		
2410	63.7		
2427	63.6		
2446	63.4		

INTERFERENCE DATA
PATTERN 15 WELL 15-2
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 7FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1011	79	2473	75.1
1093	79.1	2491	75.3
1220	79.4	2511	75.2
1328	79.6	2533	75.2
1442	79.8	2567	75.6
1565	79.8	2587	75.7
1684	80	2618	75.5
1809	80	2651	76
1965	80	2679	76.2
2042	79.7	2717	76.5
2098	80.7	2766	76.8
2125	80.7	2829	77.5
2149	80.7	2886	78
2164	80.4	3009	78.5
2192	79.5	3127	79
2225	78.7	3241	79
2263	77.8	3373	81.1
2301	76.7	3442	79.6
2318	76.7		
2346	76.5		
2382	75.8		
2398	75.3		
2421	75.1		
2438	75.1		
2456	75		

INTERFERENCE DATA
PATTERN 15 WELL 15-3
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 7FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1013	80.2	2472	72
1095	78.1	2490	71.8
1218	87.4	2510	71.7
1327	87.4	2532	71.7
1440	87.8	2566	71.9
1564	88.3	2584	72.3
1683	84.8	2617	72.9
1807	72.7	2650	73.4
1997	52	2678	73.8
2043	60	2716	74.5
2097	73	2764	75.3
2123	77.2	2828	76.7
2148	79.2	2884	77.5
2163	79.2	3008	79.6
2191	79.2	3126	81.5
2224	78.4	3240	82.3
2262	77	3371	83.6
2300	76	3442	79.6
2317	75.4		
2345	74.5		
2381	73.8		
2397	73.5		
2420	72.8		
2437	72.6		
2454	72.2		

INTERFERENCE DATA
PATTERN 15 WELL 15-4
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 7FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1006	72.2	2468	63.5
1086	70.7	2487	63.3
1232	70.4	2506	62.9
1338	70	2530	62.3
1454	70	2558	62.4
1578	69.6	2598	62
1696	69.9	2630	62
1822	70.7	2661	62
1957	74	2690	62.3
2035	75.7	2728	62.6
2091	73.8	2776	63
2117	74	2840	63.8
2145	72.8	2896	64.5
2159	72.8	3018	67.3
2188	71.8	3138	67.3
2220	70.5	3252	67.8
2259	69	3365	68.3
2295	67.4	3431	69.1
2313	67.1		
2342	66.1		
2375	65		
2394	64.6		
2416	64.2		
2433	64		
2450	63.8		

INTERFERENCE DATA
PATTERN 15 WELL 15-5
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 7FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1004	79.3	2466	77.8
1085	78.6	2485	77.7
1227	78.4	2504	77
1334	78.6	2527	76.8
1448	78.4	2556	77
1574	78	2593	77.5
1692	78.4	2626	76.7
1817	78.3	2657	76.4
1956	78.8	2685	77.5
2033	79.2	2723	76.7
2089	79.1	2773	77.5
2119	78.9	2835	77
2143	79.7	2892	77.3
2158	79.8	3016	77.5
2187	79.4	3134	78.2
2219	80	3247	77.3
2257	80	3364	77.8
2293	79.6	3420	78.5
2311	78.5		
2340	78.5		
2373	78		
2392	78.5		
2414	78.2		
2431	77.8		
2449	77.5		

INTERFERENCE DATA
PATTERN 15 WELL 15-6
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 7FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1002	77.3	2465	76.8
1083	77.8	2483	77
1228	82	2502	76.6
1336	82.6	2525	77
1451	80.8	2555	75
1575	81.3	2594	76.1
1693	80.8	2627	76.1
1818	81.1	2658	77
1933	81	2687	77.5
2032	81.1	2724	78.8
2088	83.2	2774	79
2115	84.2	2837	78.3
2142	82.4	2894	79
2157	84	3017	79.8
2186	83.5	3135	79.4
2218	83	3248	79.6
2256	83	3362	81.5
2291	82.8	3422	81.5
2309	83		
2339	81		
2369	80.5		
2389	78		
2412	78		
2430	78		
2448	77.5		

INTERFERENCE DATA
PATTERN 16 WELL 15-3
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 9FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1087	82.2	2393	81.7
1180	81.6	2414	81.6
1292	80.5	2445	81.5
1428	81.1	2477	81.3
1536	80.3	2505	80.8
1722	78.7	2555	79.2
1845	77.8	2582	78.8
1907	78.8	2613	78
1928	79.2	2646	78
1940	78.9	2703	78
1969	79	2767	77.5
1982	79.2	2822	77.4
2001	79.2	2883	77.3
2018	79.2	2945	76.9
2040	79.2	3003	77
2063	79.6	3068	77.2
2103	80.2	3125	77
2133	80.2	3185	77
2178	80.4	3243	76.9
2207	81.2	3299	77.1
2234	81.4	3392	78.3
2266	81.3	3465	79
2293	81.8		
2324	82.1		
2358	81.9		

INTERFERENCE DATA
PATTERN 16 WELL 15-4
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 9FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1079	71.7	2389	69.6
1190	71.1	2410	69.6
1296	71.1	2441	69.7
1432	71	2473	69.5
1545	69.2	2501	69.5
1724	70.5	2550	69.5
1848	70.6	2577	69.5
1922	71.1	2618	69.5
1942	71	2650	69.5
1959	71	2707	69.5
1977	70.8	2770	69.4
1996	70.9	2825	69.9
2014	70.9	2888	69.3
2036	70.8	2948	70
2059	70.9	3008	69.5
2082	70.8	3071	70.2
2118	70.6	3129	70.3
2144	70.6	3188	70.5
2173	70.4	3248	70.5
2203	70.2	3302	70.3
2229	70.3	3388	71.1
2262	70.1	3460	71.3
2290	69.9		
2321	69.7		
2354	69.8		

INTERFERENCE DATA
PATTERN 16 WELL 15-5
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 9FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1082	79.3	2379	80.5
1172	79	2403	79.1
1308	78.4	2433	78.8
1442	79	2466	78.6
1550	78.5	2491	79.5
1735	78.8	2540	79.2
1857	79	2568	78.6
1911	79.2	2630	78.2
1932	79	2660	78.5
1950	79.4	2721	78.3
1968	78.5	2778	78.3
1987	79.2	2838	78.4
2006	79.9	2897	78.5
2028	78.8	2959	78.3
2052	78.7	3019	78.3
2072	79.7	3080	78.6
2107	79.1	3139	78.7
2135	78.6	3200	78.6
2163	78.8	3255	78.5
2193	79.1	3310	78.5
2220	79.5	3377	79.6
2253	79.5	3346	79.5
2282	79.5		
2313	79.5		
2344	79.4		

INTERFERENCE DATA
PATTERN 16 WELL 16-2
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 9FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1077	60.8	2396	77.2
1175	80.3	2416	77.1
1295	80	2446	77
1430	80	2479	76.9
1539	79.9	2506	76.7
1723	79.3	2557	76.6
1846	79.1	2584	76.5
1926	79.3	2617	76.5
1946	79.2	2648	76.6
1964	79	2705	76.6
1984	79	2769	76.6
2003	78.9	2824	76.9
2020	78.7	2886	77
2042	78.4	2947	77
2065	78.2	3006	77.1
2085	78.2	3068	77.2
2123	77.8	3128	77.3
2046	77.7	3186	77.5
2180	77.4	3245	77.6
2209	77.4	3301	77.6
2241	77.2	3394	78.1
2267	77.2	3465	78.3
2295	77.1		
2326	77.2		
2360	77.2		

INTERFERENCE DATA
PATTERN 16 WELL 16-3
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 9FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1075	80.5	2392	76.1
1183	78.8	2413	76.6
1288	79.6	2443	75.5
1424	79.3	2476	76.7
1531	78.7	2503	76.3
1720	78.6	2552	75.5
1840	78.9	2579	76.6
1924	78.3	2610	75.8
1944	79.2	2640	75.8
1961	78.5	2700	76.1
1979	78.5	2763	76.1
1998	79	2820	76.2
2016	78.4	2880	76
2038	78.5	2940	76
2061	78.7	3000	76.1
2084	78.2	3065	75.6
2121	78.2	3120	75.2
2145	77.5	3180	75.2
2176	77	3240	75.4
2205	77.2	3296	75.2
2232	77.4	3390	75.8
2264	77.4	3460	75.8
2292	77		
2323	76.5		
2356	76.5		

INTERFERENCE DATA
PATTERN 16 WELL 16-4
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 9FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1070	70	2383	64
1193	73.2	2406	67.5
1302	73.5	2436	67
1434	75	2469	67
1545	74	2495	67.5
1730	70	2545	67
1853	71.5	2572	65.5
1919	71	2625	65
1937	70	2655	67
1955	71	2716	66
1973	68.5	2776	67.5
1992	73	2835	67
2010	73	2894	68
2031	71.5	2956	68
2055	74.4	3016	68
2076	69	3077	69
2113	71	3136	70
2138	66	3195	69.5
2166	70.5	3253	67
2196	65	3308	69
2224	65.5	3381	71
2257	65.7	3450	71
2284	68.5		
2316	68.7		
2348	67		

INTERFERENCE DATA
PATTERN 16 WELL 16-5
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 9FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1072	60.1	2385	58.3
1197	58	2407	59.1
1306	58.3	2437	57.8
1439	56.5	2471	57
1548	57.2	2496	57
1732	56.1	2547	56.2
1854	57.1	2574	56.4
1919	57.8	2627	57
1939	57.8	2658	56.8
1958	57	2711	56.2
1976	57.5	2774	56
1994	57.5	2831	55.5
2011	56.9	2891	55
2033	56.5	2953	55.5
2056	59	3012	56.5
2077	56.8	3076	56.3
2115	57.1	3132	56.7
2141	56.7	3192	56.2
2169	56.8	3250	55.2
2198	56.5	3305	55.9
2226	55.5	3384	56.8
2256	56.2	3452	56.7
2287	56.5		
2318	57.4		
2349	57.5		

INTERFERENCE DATA
PATTERN 16 WELL 16-6
BELLEVUE FIELD; BOSSIER PA, LA

ET=0 AT 0000 HR 9FEB77

ET (MIN)	MANOMETER RDG(CM)	ET (MIN)	MANOMETER RDG(CM)
1084	71.2	2387	67.7
1170	70.6	2408	67.8
1311	70.4	2439	67.8
1444	70.3	2472	67.9
1553	70	2498	67.6
1737	69.7	2548	67.6
1858	69.7	2576	67.7
1913	69.6	2631	68
1934	69.6	2662	68
1952	69.5	2722	68
1970	69.6	2781	68.1
1995	69.4	2840	68.5
2012	69.4	2900	68.6
2035	69.2	2960	68.6
2058	69.2	3021	69.1
2080	68.8	3082	69.1
2116	68.5	3141	69.1
2143	68.5	3201	69.1
2170	68.4	3256	69.3
2200	68.3	3312	69.3
2228	67.9	3385	69.4
2261	68	3455	69.6
2288	67.7		
2319	68		
2351	67.9		

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