DOE/ET/13077-49
Distribution Category UC-92a

COMMERCIAL SCALE DEMONSTRATION, ENHANCED OIL RECOVERY BY MICELLAR-POLYMER FLOOD

Annual Report
October 1979—September 1980

Work Performed for the Department of Energy
Under Contract No. DE-AC19-78ET13077

Date Published—April 1981

Marathon Oil Company
Findlay, Ohio

U. S. DEPARTMENT OF ENERGY

DISCLAIMER

"This book was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof."

Available from the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161.

NTIS price codes

Paper copy:	$9.00
Microfiche copy:	$3.50

DOE/ET/13077-49
Distribution Category UC-92a

COMMERCIAL SCALE DEMONSTRATION ENHANCED OIL RECOVERY BY MICELLAR-POLYMER FLOOD

Annual Report For the Period
October 1979—September 1980

By

J. C. Howell
W. O. Snyder
Marathon Oil Company
Findlay, Ohio 45840

Roy E. Porter, *Technical Project Officer*
Bartlesville Energy Technology Center
Bartlesville, Oklahoma 74003

Prepared for the Department of Energy
Under Contract No. DE-AC19-78ET-13077

Date Submitted—November 1980
Date Published—April 1981

U. S. DEPARTMENT OF ENERGY

TABLE OF CONTENTS

SUBJECT	PAGE NUMBER
Table of Contents.	ii
Introduction	1
Summary.	2
Fluid Summary Data Sheet	3
Polymer Injection.	5
Injection Well Stimulation	5
Perimeter Fluid Injection Operations	6
Production Well Stimulation.	7
Fluid Treating	7
Transient Testing.	9
Tritiated Water Injection Program.	9
High Sulfonate Content Wells	10
Oil Cut Monitoring	11
TABLES--	
Table 1, Injection Well Stimulation Results.	12
Table 2, Abandoned Perimeter Injection Wells	14
Table 3, Oil Well Stimulation Results.	15
Table 4, Injection Well Transient Tests.	20
Table 5, Pressure Monitoring - Oil Wells	21
Table 6, Tritiated Water Injection Wells	22

Table of Contents

SUBJECT	PAGE NUMBER
FIGURES--	
Figure 1, M-1 Project Wells	23
Figure 2, Oil Rate vs. Time	24
Figure 3, Cumulative Oil vs. Time	25
Figure 4, Oil Cut vs. Time.	26
Figure 5, 2.5-Acre Spacing-Injection Rate vs. Time, Plant Pressure vs. Time	27
Figure 6, 5.0-Acre Spacing-Injection Rate vs. Time, Plant Pressure vs. Time	28
Figure 7, 2.5-Acre Spacing-Cumulative Injection vs. Time, Pore Volume Injected vs. Time	29
Figure 8, 5.0-Acre Spacing-Cumulative Injection vs. Time, Pore Volume Injected vs. Time	30
Figure 9, 2.5-Acre Spacing-Injection/Production vs. Time.	31
Figure 10, 5.0-Acre Spacing-Injection/Production vs. Time.	32
Figure 11, 2.5-Acre Spacing-Oil Rate vs. Pore Volume Injected.	33
Figure 12, 5.0-Acre Spacing-Oil Rate vs. Pore Volume Injected.	34
Figure 13, Total M-1 Project-Oil Rate vs. Pore Volume Injected	35
Figure 14, 2.5-Acre Spacing-Oil Cut vs. Pore Volume Injected	36
Figure 15, 5.0-Acre Spacing-Oil Cut vs. Pore Volume Injected	37
Figure 16, Total M-1 Project-Oil Cut vs. Pore Volume Injected.	38
Figure 17, Schematic of 2.5-Acre Production Treating Facility.	39
Figure 18, Schematic of 5.0-Acre Production Treating Facility.	40
Figure 19, Schematic of 2.5 and 5.0-Acre Combined Stream Production Facility	41
Figure 20, Schematic of M-1 Emulsion Treating Facility	42

Table of Contents

SUBJECT	PAGE NUMBER
Figure 21, Transient Testing Wells	43
Figure 22, Tritiated Water Injection Wells	44
COMPUTER RUNS--	
2.5-Acre Pattern Data Summary	45
5.0-Acre Pattern Data Summary	47
2.5-Acre Injection Report	49
5.0-Acre Injection Report	53
Peripheral Injection Well Report	55
2.5-Acre Five-Spot Report	56
5.0-Acre Five-Spot Report	66
2.5-Acre Sulfonate Report	71
5.0-Acre Sulfonate Report	86
2.5-Acre Chloride Report	91
5.0-Acre Chloride Report	106
Tritiated Water Report	111

INTRODUCTION

A contract was executed between the United States Energy Research and Development Administration (now Department of Energy) and Marathon Oil Company, Findlay, Ohio, on September 30, 1976, for the purpose of a commercial scale test of enhanced oil recovery by the Maraflood™ oil recovery process.

This commercial scale test, known as the M-1 Project, is located in Crawford County, Illinois. It encompasses 407 acres of Robinson sand reservoir and covers portions of several waterflood projects that were approaching economic limit. The project includes 248 acres developed on a 2.5-acre five-spot pattern and 159 acres developed on a 5.0-acre five-spot pattern.

Development work commenced in late 1974 and has previously been reported.[1,2] Micellar solution (slug) injection was initiated on February 10, 1977, and is now completed. After 10% of a pore volume of micellar slug was injected, injection of 11% pore volume of Dow 700 Pusher™ polymer was conducted at a concentration of 1156 ppm. At the end of this reporting period, 625 ppm polymer was being injected into the 2.5-acre pattern and 800 ppm polymer was being injected into the 5.0-acre pattern.

The oil cut of the 2.5 and 5.0-acre patterns increased from 8.6% and 5.2%, respectively in September, 1979, to 11.0% and 5.9% in September, 1980. The oil cut performance has consistently exceeded that predicted for the project.

---

[1]Commercial Scale Demonstration - Enhanced Oil Recovery by Micellar-Polymer Flooding, M-1 Project - Facilities Report (BERC/TPR-77/2), DOE Technical Information Center (Bartlesville, Oklahoma, 4/77).

[2]Commercial Scale Demonstration - Enhanced Oil Recovery by Micellar-Polymer Flooding, M-1 Project - Design Report (BERC/TPR-77/1), DOE Technical Information Center (Bartlesville, Oklahoma, 4/77).

Pusher™ - Trademark of Dow Chemical Company
Maraflood™ - Trademark of Marathon Oil Company

SUMMARY

This Fourth Annual Report covers the interim from October 1, 1979, through September 30, 1980. The report is organized under three Work Breakdown Structures (WBS) which are summarized below.

WBS No. 2100 - Fluid Injection

1) Polymer injection has continued in varying concentrations. At the end of the reporting period, the polymer concentrations were 625 and 800 ppm in the 2.5- and 5.0-acre patterns, respectively.

2) A program of stimulating injection wells has continued. The stimulation of seven injection wells is reported with favorable results.

3) Several perimeter injection wells were plugged and abandoned as a result of operations at an adjacent project.

WBS No. 2200 - Production

1) A program of stimulating producing wells has continued. The hydraulic fracture treatment of 23 wells is reported with favorable results.

2) The 2.5- and 5.0-acre produced fluid streams have been combined for treating advantages.

WBS No. 2300 - Performance Monitoring

1) Analysis of the transient test data from all six injection wells tested indicates that wellbore damage has occurred during polymer injection. Data from pressure tests in five of six producing wells show slight wellbore damage.

2) Subsequent to injection of tritiated water into ten injection wells, produced fluids from all oil wells have been analyzed monthly for the presence of tritiated water. As of August, 1980, 52 wells have shown the presence of tritiated water.

3) Samples of produced water have been collected monthly and analyzed for sulfonate (a slug component) content. In September, 1980, 119 wells indicated sulfonate levels higher than background levels.

4) The oil cut of the 2.5-acre pattern has leveled off over the past eight months at about 11%. An increase in the 5.0-acre pattern oil cut over the past five months from 3.9% to 5.9% is consistent with a production increase projected to occur as a result of the injection of Maraflood Process fluids. This parallels the increase of the 2.5-acre pattern as reported in the last Annual Report.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077-49

Fluid Summary Data Sheet
September, 1980

	2.5-Acre Spacing	5.0-Acre Spacing	Total Project
Oil Production			
B/D	452	122	574
B/M	13,558	3,666	17,224
Cumulative, Bbls.	314,936	117,652	432,588
% PV	2.96	1.96	2.60
Oil Cut - %			
This Month	11.0	5.9	9.3
Last Month	10.4	6.5	9.1
Cumulative	7.4	4.7	6.4
Total Fluid Production			
B/D	4,092	2,055	6,147
B/M	122,762	61,663	184,425
Cumulative, Bbls.	4,235,451	2,524,802	6,760,253
% PV	39.9	42.1	40.7
Fluid Injection			
B/D	5,165	1,648	6,813
B/M	154,912	49,478	204,390
Cumulative, Bbls.	4,563,717	1,621,322	6,185,039
% PV	42.9	27.0	37.2
Injection/Production Ratio*			
This Month	1.15	1.18	1.16
Last Month	1.27	.99	1.17
Cumulative	1.00	.90	.97

*Injection includes allocated peripheral water injection and allocated micellar-polymer injection. Production is actual production as shown above.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077-49

Fluid Summary Data Sheet (Cont'd.)
September, 1980

	2.5-Acre Spacing	5.0-Acre Spacing	Total Project
Reservoir Pore Volume	10,627,513	5,996,535	16,624,048
Plant Pressure, psig	667	663	666
Polymer Viscosity, cp	19.2	27.9	21.3
Polymer Screen Factor	19.7	21.5	20.1
Wells			
Producers	91	41	132
Injectors			
Micellar Fluid	85	29	114
Water	6	6	12
Water Disposal	1	1	2
Abandoned	6	0	6

Fluid Injection Schedule		Polymer, ppm		
	Slug	1156	800	625
2.5-Acre				
Starting Date	2/10/77	11/21/78	5/20/79	7/28/80
% PV Actual	10.0	11.0	19.0	2.9
% PV Ultimate	10.0	11.0	19.0	32.0
Cumulative, Bbls.	1,063,446	1,169,677	2,019,170	311,425
5.0-Acre				
Starting Date	2/10/77	11/21/78	1/14/80	
% PV Actual	10.0	11.0	6.0	
% PV Ultimate	10.0	11.0	19.0	
Cumulative, Bbls.	599,679	658,999	362,642	

POLYMER INJECTION

Introduction

Polymer injection was initiated November 21, 1978, and has continued in varying concentrations. A table of polymer concentrations injected to date is included in the Fluid Summary Data Sheet.

Discussion

Dow polymer concentration was reduced from 1156 to 800 ppm on January 14, 1980, in the 5.0-acre pattern. During the first week of operation at the reduced concentration, the injection rate averaged 1,161 BPD (1.56 barrels per day per net foot B/D/NF) at 500 psi. The Brookfield viscosity at 6 rpm and 72° F averaged 31.3 cp. The screen factor averaged 21.9 at 77° F. This compares to September, 1980, data of 1,648 BPD (2.21 B/D/NF) at 663 psi, a Brookfield viscosity of 27.9 cp, and a screen factor of 21.5 at 77° F.

Dow polymer concentration was reduced from 800 to 625 ppm on July 28, 1980, in the 2.5-acre pattern. During the first week of operation at the reduced concentration, injection rate averaged 4,771 BPD (1.84 B/D/NF) at a plant pressure of 655 psi. The Brookfield viscosity at 6 rpm and 72° F averaged 21.8 cp. The screen factor averaged 17.9 at 77° F. This compares to September, 1980, data of 5,165 BPD (1.99 B/D/NF) at 667 psi, a Brookfield viscosity of 19.2 cp, and a screen factor of 19.7 at 77° F.

INJECTION WELL STIMULATION

Introduction

In order to maintain adequate injection rates and to maintain acceptable fluid conformance in each pattern, an injection well stimulation program has been continued.

Discussion

Since September 30, 1979, six injection wells have been hydraulically fractured and propped with sand-laden fluid. One injection well has been jetted with high pressure water. Fracture procedures utilized a cross-linked polymer to gel the water to approximately 2,200 cp with 10/20 mesh sand used as the propping agent. Each fracture treatment was designed to produce a 35-foot propped radius. The jetting procedure was used as an experimental alternative to fracture treating.

Table 1 lists all injection wells which have been stimulated since slug initiation. Also included in this table are before- and after-stimulation injection rates and fracture treatment data. The injection rates of the

INJECTION WELL STIMULATION (Continued)

Discussion (Continued)

recently stimulated wells increased from an average of 0.83 B/D/NF before stimulation to 4.77 B/D/NF after stimulation.

PERIMETER FLUID INJECTION OPERATIONS

Introduction

Several wells along the perimeter of the M-1 Project are used to minimize migration of Maraflood fluids beyond the boundaries of the project. The performance of these wells for September, 1980, is shown on page 55.

Discussion

Water injection wells A-12, X-3, X-91, X-94, and X-97 have been plugged and abandoned as a result of operations at the adjacent project. Table 2 lists the dates when these and wells X-9 and X-12 were abandoned. Perimeter injection wells X-9 and X-12 were abandoned last year.

Reservoir pressure is now maintained by injection wells in the adjacent project. These wells include PI-1, PI-3, PI-4, PI-6, X-6, and CF-6. They are listed on the Peripheral Injection Well Report on page 55. Figure 1 has been updated to reflect the changes.

PRODUCTION WELL STIMULATION

Introduction

To insure adequate withdrawal rates and to maintain acceptable fluid conformance in each pattern, a production well stimulation program has been continued.

Discussion

Since September 30, 1979, 23 production wells have been hydraulically fractured and propped with sand-laden fluid. Fracture procedures were identical to those previously described for injection wells.

Table 3 lists all production wells which have been fractured since initiation of slug injection. Also included in this table are before- and after-production rates and fracture treatment data. The fluid production of the recently stimulated wells increased from a total of 520 BPD before stimulation to 2,424 BPD after stimulation.

FLUID TREATING

Introduction

In the past, the 2.5- and 5.0-acre pattern produced fluid streams were treated in separate, parallel facilities. These streams have been combined to 1) save energy, 2) save labor, and 3) reduce risk of process upset.

Discussion

Prior to May 3, 1980, the 2.5-acre total fluid stream flowed through a free water knockout where gas was vented and on through a Barton net oil computer and into the 10,000-barrel tank at the 13-foot level (see Figure 17). The incoming fluid received 2,000 ppm of Tretolite RP-578 treating chemical prior to the free water knockout. Water from the bottom of the 10,000-barrel tank flowed to the Dewey pit and eventually to the salt water disposal wells. Oil flowed from the 18-foot level of the 10,000-barrel tank and received a treatment consisting of the addition of 1,500 ppm RP-578 and 25% fresh water. This stream was heated and the oil separated from the water and sold.

The oil and water from the 5.0-acre pattern fluids were separated in the 5.0-acre free water knockouts as shown in Figure 18. The water went into the 10,000-barrel tank and was eventually disposed with the 2.5-acre produced water. The 5.0-acre oil stream flowed through a Barton net oil computer, received a treatment consisting of the addition of 1,250 ppm RP-578 and 25% fresh water. The oil stream was then heated, separated, and sold.

FLUID TREATING (Continued)

Discussion (Continued)

On May 3, 1980, the 2.5-and 5.0-acre pattern produced fluids were combined as shown in Figure 19. The produced oil and water in each pattern flows through the free water knockouts to vent any associated gas prior to flowing through the net oil computers and into the 10,000-barrel tank. The water flows from the bottom of the 10,000-barrel tank to disposal. Oil flows from the 18-foot level of the 10,000-barrel tank where 25% water and 1,500 ppm RP-578 is added. As in the past the oil is then heated, separated and sold.

The emulsion treating facility for recycling emulsion effluents to extinction is shown on Figure 20. Purged oil or draws can be treated with chemical and water, heated and, if necessary, reheated prior to oil separation and sale.

The Advantages of Combined Processes

The combined system process has several advantages over the separate flow stream process. Due to a lower throughput, the 5.0-acre chem-electric heater-treaters consumed more energy per barrel of oil treated than the 2.5-acre treaters. Combining the two streams reduces labor costs. The combined facility uses half as many treating vessels such as free water knockouts and heater-treaters.

Combining the two streams minimizes the possibility of a major treating upset. The difficulty in treating oil is proportional to the concentration of sulfonate being produced. Combining the two produced fluid streams has the effect of reducing the peak sulfonate value.

TRANSIENT TESTING

Introduction

In compliance with contractual requirements, transient testing is conducted on six injection wells and six producing wells.

Discussion

During the third quarter of 1980, six injection wells (C-3, I-7, O-13, S-7, GG-13, and QQ-13) were transient tested. These tests were conducted as part of the continuing effort to determine the effect of Maraflood fluids on well conditions and reservoir parameters. Amerada pressure gauges were set at an approximate depth of 800 feet below the surface to enable pressure falloff and buildup data to be collected for each injection well. Results were then analyzed using a Miller-Dyes-Hutchinson plot.

Table 4 summarizes the results of the transient tests. Also included in this table are the results of past transient tests conducted on the injection wells.

The latest series of injection well tests were taken during injection of the 800 ppm polymer. The results show an increase in skin factor in all six wells, indicating accumulating skin damage.

Oil well pressure transient tests are based on fluid level measurements obtained by echometer readings. This eliminates the need to pull rods as would be necessary if a pressure bomb were used. These results are also analyzed using a Miller-Dyes-Hutchinson plot.

Table 5 summarizes the results of this year's and previous years' producing well transient tests. The latest test shows that skin factor has increased slightly in five out of six wells.

Figure 21 shows the location of these transient tested wells.

TRITIATED WATER INJECTION PROGRAM

Introduction

In order to analyze the parameters controlling fluid communication, such as directional permeability, fracture orientation, and fluid conformance, a radioactive tracer (tritiated water) was injected into selected injection wells in the M-1 Project prior to slug injection. Produced fluid samples from

TRITIATED WATER INJECTION PROGRAM (Continued)

Introduction (Continued)

oil wells are analyzed monthly to determine the presence of radioactive material.

Discussion

A computer printout listing all wells showing tritiated water contents higher than background levels is shown on pages 111 to 120. Thirty-three wells indicated the presence of tritiated water in the produced fluid stream in August, 1980. As of August, 1980, 52 wells have shown the presence of tritiated water. Of these 52 wells, 26 wells have shown a tritiated water content higher than background levels for six or more months. Thirty of the 52 wells are adjacent to a well in which tritiated water was injected. No conclusions have been developed as a result of this data.

HIGH SULFONATE CONTENT WELLS

Introduction

As part of routine performance analysis, produced water from each oil well is sampled monthly and analyzed for sulfonate at Marathon's Denver Research Center.

Discussion

Beginning in March, 1977, produced water samples from each M-1 Project well have been analyzed to determine sulfonate content. Pages 71 to 90 list the results of this monthly analysis. The values found on these pages are equivalent to the concentration of sulfonate in water divided by the concentration of standard 1% solution of crude oil sulfonate slug (COSS). Because of the characteristics of surfactant components interacting with the reservoir, these analytical data are not suitable for material balance calculations. However, these data are useful for observing trends.

For the month of September, 1980, 88 wells in the 2.5-acre pattern showed sulfonate levels higher than the background level (.5%). This compares to 79 wells in September, 1979. Every oil well on the 2.5-acre pattern has shown sulfonate levels greater than the background level for at least three months.

Thirty-one wells in the 5.0-acre pattern showed sulfonate levels higher than background levels during the month of September. This compares with 11 wells in September, 1979. Sulfonate data for the 2.5- and 5.0-acre patterns are shown on pages 71 to 90.

OIL CUT MONITORING

Introduction

In order to detect production responses resulting from the Maraflood process, individual oil cuts are monitored on a monthly basis.

Discussion

During September, 1980, 76 wells on the 2.5-acre pattern and 24 wells on the 5.0-acre pattern produced at or above a 5% oil cut. This compares to 58 wells and 18 wells, respectively in September, 1979. During September, 1980, the 2.5- and 5.0-acre patterns produced oil cuts of 11.0% and 5.9%, respectively. These compare with 8.6% and 5.2%, respectively in September, 1979. As shown on Figures 14 and 15, the oil cuts of both patterns have remained slightly above predicted. Individual oil cuts are reported on the five-spot reports, pages 56 to 70.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077-49

TABLE 1

Injection Well Stimulation Results

Well No.	Treatment Date	Injection Rate B/D/NF		Fracture Fluid Viscosity	Treatment Size				
					Gelled Water		Sand		Sand Removed
		Before	After		Pad (Gal.)	Body (Gal.)	Pounds	Mesh	From Well (Lbs.)
A-11	5/23/77	0.32	1.64	H	1,600	600	2,400	10-20	100
M-1	6/06/77	0.78	2.00	H	1,600	800	3,200	10-20	200
K-11	6/06/77	0.22	2.00	H	1,600	750	3,000	10-20	928
C-7	6/06/77	0.68	2.00	H	1,600	450	1,800	10-20	N/A
I-9	6/10/77	0.45	0.83	H	1,600	800	3,200	10-20	N/A
W-3	6/10/77	0.47	2.11	H	1,600	800	3,200	10-20	2,000
C-5	6/20/77	0.36	2.00	H	1,600	450	1,800	10-20	N/A
J. Wasson									
A-12	7/26/77	SI	9.00	H	1,600	2,400	9,600	10-20	N/A
UU-1	8/08/77	SI	5.00	H	1,600	800	3,200	10-20	N/A
UU-5	8/16/77	SI	5.63	H	1,600	700	2,800	10-20	N/A
Brubaker-Prier Fee									
R-12	8/31/77	2.77	7.05	H	1,600	1,100	4,400	10-20	N/A
C-3	8/31/77	1.00	1.36	H	1,600	350	1,400	10-20	100
G-11	9/07/77	0.61	0.94	H	1,600	500	2,000	10-20	400
G-13	9/08/77	0.67	1.56	H	1,600	375	1,500	10-20	500
Q-5	9/13/77	0.11	1.31	H	1,600	775	1,000	10-20	N/A
W-5	9/13/77	0.05	1.37	H	1,600	875	3,500	10-20	400
E-1	9/19/77	0.72	1.67	H	1,600	475	1,900	10-20	200
C-9	9/23/77	0.58	0.53	H	1,600	575	2,300	10-20	300
QQ-15	12/07/77	0.64	0.89	H	1,600	775	3,100	10-20	100
E-5	12/28/77	0.73	0.37	H	1,600	375	1,500	10-20	200
GG-13	5/10/78	1.52	2.12	H	1,550	1,025	4,100	10-20	N/A
SS-1	5/15/78	1.05	2.72	H	1,600	600	2,400	10-20	N/A
EE-15	5/16/78	1.07	1.33	H	1,600	1,225	4,900	10-20	N/A
EE-11	5/17/78	1.21	2.25	H	1,400	600	1,200	10-20	N/A
KK-13	5/17/78	1.54	4.77	H	1,600	650	2,600	10-20	N/A
OO-13	5/18/78	1.03	2.21	H	1,600	600	400	10-20	N/A
QQ-13	5/19/78	1.19	2.44	H	1,600	1,025	4,100	10-20	N/A

* This well received a decentralized jet stimulation.
H = Fractured with high viscosity fluid.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077-49

TABLE 1

Injection Well Stimulation Results (Continued)

Well No.	Treatment Date	Injection Rate B/D/NF		Fracture Fluid Viscosity	Treatment Size				
					Gelled Water		Sand		Sand Removed
		Before	After		Pad (Gal.)	Body (Gal.)	Pounds	Mesh	From Well (Lbs.)
Q-3	1/09/80	1.21	4.53	H	1,600	700	2,800	10-20	990
MM-15	2/10/80	1.11	2.84	H	1,600	675	2,700	10-20	330
I-7*	9/17/80	0.34	1.55	--	--	--	--	--	--
O-3	10/03/80	0.04	4.65	H	1,600	750	3,000	10-20	N/A
SS-11	10/13/80	1.52	9.36	H	1,600	650	2,600	10-20	N/A
Q-5	10/15/80	0.52	4.38	H	1,600	800	3,200	10-20	N/A
SS-3	10/15/80	1.10	6.05	H	1,600	800	3,200	10-20	N/A

* This well received a decentralized jet stimulation.
H = Fractured with high viscosity fluid.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077-49

TABLE 2

Abandoned Perimeter Injection Wells

Well No.	Cum. Water Injection Bbls.	Date Abandoned
A-12	48,185	4/30/80
X-3	12,202	3/27/80
X-9	17,020	8/19/79
X-12	3,868	8/11/79
X-91	97	4/22/80
X-94	11,498	4/17/80
X-97	8,596	6/23/80

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077-49

TABLE 3

Oil Well Stimulation Results

Well No.	Treatment Date	Test Data: Test Prior BO/D	Test Prior BW/D	Test Prior BF/D	Test After BO/D	Test After BW/D	Test After BF/D	Fracture Fluid Viscosity	Treatment Size: Gelled Water Pad (Gal.)	Gelled Water Body (Gal.)	Sand Pounds	Sand Mesh	Sand Removed From Well Lbs.	Comments
XA-10	2/10/77	0.0	0.0	0.0	0.4	0.2	0.6	H	1,600	250	1,000	10-20	285	
XA-12	2/10/77	N/A	N/A	4.2	15.5	3.7	19.2	H	1,600	300	1,200	10-20	70	
B-6	2/11/77	0.0	0.0	0.0	0.9	2.4	3.3	H	1,600	250	1,000	10-20	200	
F-0	2/14/77	N/A	N/A	4.2	5.1	14.0	19.1	H	1,600	250	1,000	10-20	350	
J-14	2/14/77	N/A	N/A	12.0	3.2	98.4	101.6	H	1,600	550	1,000	10-20	200	
B-8	2/17/77	6.0	0.0	6.0	8.8	7.2	16.0	L	1,600	250	2,200	10-20	72	
B-10	2/17/77	0.0	0.0	0.0	0.0	0.0	0.0	L	1,600	250	1,000	10-20	500	Sanded Out
F-12	2/17/77	N/A	N/A	6.4	1.7	10.1	11.8	L	1,600	250	1,000	10-20	115	
F-14	2/28/77	N/A	N/A	2.4	2.9	8.2	11.1	L	1,600	250	1,000	10-20	N/A	
H-2	2/28/77	N/A	N/A	11.5	1.9	18.9	20.8	L	1,600	450	1,800	10-20	142	
J-12	3/01/77	N/A	N/A	4.2	4.4	72.3	76.7	H	1,600	350	1,400	10-20	N/A	
B-16	3/04/77	0.4	14.2	14.6	4.4	101.6	106.0	L	1,600	450	1,800	10-20	N/A	
F-4	3/07/77	N/A	N/A	19.2	0.2	19.8	20.0	L	1,600	250	1,000	10-20	100	
F-10	3/08/77	N/A	N/A	13.5	0.4	10.6	11.0	L	1,600	350	1,400	10-20	75	
D-0	3/18/77	0.5	10.8	11.3	0.9	77.4	78.4	L	1,600	250	1,000	10-20	225	
AA-11	3/16/77	N/A	N/A	24.0	0.8	88.8	89.6	H	1,600	500	2,000	10-20	140	
D-4	3/28/77	N/A	N/A	92.6	11.3	63.4	74.7	H	1,600	250	1,000	10-20	N/A	
JJ-12	3/16/77	0.9	27.9	28.8	8.9	73.6	82.5	H	1,600	450	1,900	10-20	200	
JJ-14	3/22/77	0.0	2.4	2.4	0.9	8.1	9.0	H	1,600	325	1,300	10-20	150	
DD-10	3/23/77	2.0	0.0	2.0	0.3	10.1	10.4	H	1,600	250	1,000	10-20	143	
LL-14	3/28/77	0.1	2.3	2.4	0.6	17.8	18.4	H	1,600	325	1,300	10-20	500	
DD-14	3/31/77	4.4	54.6	59.0	8.9	97.3	106.2	H	1,600	775	3,100	10-20	N/A	

H = Fractured with high viscosity fluid.
L = Fractured with low viscosity fluid.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077-49

TABLE 3

Oil Well Stimulation Results (Continued)

Well No.	Treatment Date	Test Data: Test Prior BO/D	Test Prior BW/D	Test Prior BF/D	Test After BO/D	Test After BW/D	Test After BF/D	Fracture Fluid Viscosity	Treatment Size: Gelled Water Pad (Gal.)	Gelled Water Body (Gal.)	Sand Pounds	Sand Mesh	Sand Removed From Well Lbs.	Comments
PP-14	4/01/77	0.6	27.2	27.8	0.0	94.3	94.3	H	1,600	775	3,100	10-20	200	
PP-16	4/01/77	0.5	23.5	24.0	3.7	84.8	88.5	H	1,600	625	2,500	10-20	300	
DD-16	4/06/77	0.2	22.8	23.0	8.1	142.0	150.1	H	1,600	475	1,900	10-20	N/A	
RR-14	4/07/77	0.3	1.1	1.4	9.0	9.4	18.4	H	1,600	400	1,600	10-20	75	
TT-4	4/07/77	0.4	4.7	5.1	11.8	54.6	66.4	H	1,600	550	2,200	10-20	30	
TT-6	4/13/77	0.4	15.3	15.7	4.7	90.2	94.9	H	1,600	475	1,900	10-20	100	
FF-18	4/13/77	0.2	16.8	7.0	3.0	94.6	97.6	H	1,600	775	3,100	10-20	240	
FF-20	4/15/77	0.4	0.1	0.5	6.5	5.5	12.0	H	1,600	250	1,000	10-20	N/A	
HH-16	4/15/77	0.0	10.3	10.3	17.5	56.1	73.6	H	1,600	400	1,600	10-20	145	
RR-6	4/18/77	0.8	4.5	5.3	3.5	92.5	96.0	H	1,600	400	1,600	10-20	100	
DD-18	4/18/77	0.0	22.3	22.3	3.7	90.7	94.4	H	1,600	475	1,900	10-20	N/A	
FF-16	4/21/77	1.0	12.8	13.8	6.0	129.7	135.7	H	1,600	550	2,200	10-20	100	
H-14	4/21/77	0.0	13.6	13.6	0.5	39.5	40.0	H	1,600	350	1,400	10-20	N/A	
J-4	4/25/77	1.5	16.0	17.5	0.5	93.9	94.4	H	1,600	450	1,800	10-20	200	
RR-4	4/25/77	0.8	11.2	12.0	3.3	32.7	36.0	H	1,600	700	2,800	10-20	100	
H-10	4/27/77	0.2	12.6	12.8	3.7	96.6	100.3	H	1,600	350	1,400	10-20	50	
B-12	4/28/77	3.0	5.0	8.0	16.2	19.2	35.4	H	1,600	400	1,600	10-20	75	
R-4	4/29/77	N/A	N/A	N/A	N/A	N/A	N/A	H	1,600	300	1,200	10-20	N/A	Sanded out
J-0	4/29/77	2.0	15.6	17.6	1.6	20.8	22.4	H	1,600	450	1,800	10-20	N/A	Sanded out
H-12	5/03/77	0.6	12.0	12.6	1.4	81.1	82.5	H	1,600	300	1,200	10-20	N/A	
R-4	5/06/77	0.3	10.1	10.4	6.6	34.7	41.3	H	1,600	300	1,200	10-20	N/A	Re-fracture
H-4	5/09/77	0.3	21.3	21.6	0.0	70.8	70.8	H	1,600	450	1,800	10-20	N/A	

H = Fractured with high viscosity fluid.
L = Fractured with low viscosity fluid.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077-49

TABLE 3

Oil Well Stimulation Results (Continued)

Well No.	Treatment Date	Test Data						Fracture Fluid Viscosity	Treatment Size					
		Test Prior			Test After				Gelled Water		Sand		Sand Removed From Well	
		BO/D	BW/D	BF/D	BO/D	BW/D	BF/D		Pad (Gal.)	Body (Gal.)	Pounds	Mesh	Lbs.	Comments
L-2	5/09/77	0.2	16.9	17.1	0.5	31.0	31.5	H	1,600	750	3,000	10-20	1,500	
F-6	5/13/77	0.3	12.5	12.8	4.4	125.3	129.7	H	1,600	450	1,800	10-20	300	
N-2	5/16/77	1.0	18.1	19.1	2.2	109.9	112.1	H	1,600	550	2,200	10-20	N/A	
R-12	5/17/77	1.0	24.6	25.6	23.6	82.5	106.1	H	1,600	650	2,600	10-20	N/A	
D-6	5/18/77	2.8	24.4	27.2	3.0	114.9	117.9	H	1,600	450	1,800	10-20	N/A	
N-4	5/20/77	5.8	28.7	34.5	23.6	82.5	106.1	H	1,600	550	2,200	10-20	N/A	
D-2	5/23/77	1.4	8.2	9.6	2.3	21.1	23.4	H	1,600	250	1,000	10-20	100	
R-6	5/24/77	0.1	9.0	9.1	3.7	61.2	64.9	H	1,600	450	1,800	10-20	100	
N-6	5/25/77	2.8	53.8	56.6	4.4	90.0	94.4	H	1,600	1100	4,400	10-20	125	
H-0	5/27/77	10.1	30.3	40.4	23.6	70.8	94.4	H	1,600	450	1,800	10-20	N/A	
R-8	5/31/77	0.0	16.8	16.8	1.5	92.8	94.3	H	1,600	550	2,200	10-20	N/A	
N-8	6/01/77	1.9	222.1	224.0	1.5	128.2	129.7	H	1,600	950	3,800	10-20	200	
HH-12	6/03/77	0.3	7.7	8.0	1.5	81.0	82.5	H	1,600	350	1,400	10-20	N/A	
H-6	6/27/77	0.4	6.3	6.7	0.0	109.5	109.5	H	1,600	500	2,000	10-20	300	
T-6	6/28/77	0.0	5.3	5.3	3.0	44.2	47.2	H	1,600	400	1,600	10-20	N/A	
XA-10	6/09/77	0.0	0.0	0.0	0.0	0.0	0.0	H	1,600	400	1,600	10-20	500	Re-fracture
B-10	6/27/77	0.0	0.0	0.0	0.0	0.0	0.0	H	1,600	500	2,000	10-20	N/A	Re-fracture
T-12	7/05/77	0.7	40.9	41.6	0.6	60.7	61.3	H	1,600	600	2,400	10-20	N/A	
H-8	7/06/77	0.0	9.3	9.3	3.0	91.3	94.3	H	1,600	450	1,800	10-20	50	
R-14	7/08/77	1.1	17.3	18.4	10.4	69.6	80.0	H	1,600	900	3,600	10-20	100	
V-6	7/11/77	2.4	3.1	5.5	1.1	11.0	12.1	H	1,600	350	1,400	10-20	N/A	
FF-12	7/12/77	0.0	14.4	14.4	1.5	81.0	82.5	H	1,600	450	1,800	10-20	350	

H = Fractured with high viscosity fluid.
L = Fractured with low viscosity fluid.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077-49

TABLE 3

Oil Well Stimulation Results (Continued)

Well No.	Treatment Date	Test Data: Test Prior BO/D	Test Prior BW/D	Test Prior BF/D	Test After BO/D	Test After BW/D	Test After BF/D	Fracture Fluid Viscosity	Treatment Size: Gelled Water Pad (Gal.)	Gelled Water Body (Gal.)	Sand Pounds	Sand Mesh	Sand Removed From Well Lbs.	Comments
TT-10	7/15/77	1.5	8.5	10.0	8.3	27.7	36.0	H	1,600	550	2,200	10-20	N/A	
TT-8	7/15/77	0.2	3.8	4.0	0.3	26.1	26.4	H	1,600	550	2,200	10-20	100	
L-12	7/18/77	0.5	17.9	18.4	0.5	21.1	21.6	H	1,600	500	2,000	10-20	350	
J-6	7/21/77	0.6	18.0	18.6	0.0	16.0	16.0	H	1,600	500	2,000	10-20	100	
A R Smith														
35	7/25/77	1.4	8.1	9.5	11.8	76.7	88.5	H	1,600	1000	4,000	10-20	350	
J-8	7/28/77	1.5	17.7	19.2	1.5	22.1	23.6	H	1,600	500	2,000	10-20	70	
A R Smith														
36	8/03/77	0.5	54.5	55.0	1.3	102.2	103.5	H	1,600	100	4,000	10-20	N/A	
Brubaker-Prier Fee														
18	8/04/77	0.2	0.1	0.3	0.0	26.8	26.8	H	1,600	1100	4,400	10-20	200	
N-10	8/12/77	0.3	31.7	32.0	0.6	30.9	31.5	H	1,600	1250	1,500	10-20	900	
RR-12	10/28/77	0.0	27.5	27.5	2.0	80.5	82.5	H	1,600	620	2,500	10-20	50	
RR-14	11/03/77	2.3	5.7	8.0	5.0	11.8	16.8	H	1,600	465	1,860	10-20	N/A	
PP-12	11/10/77	0.8	24.5	25.3	3.0	85.5	88.5	H	1,600	625	2,500	10-20	N/A	
TT-2	11/15/77	0.4	4.1	4.5	0.5	4.2	4.7	H	1,600	970	3,880	10-20	200	
NN-12	11/17/77	0.3	27.8	28.1	5.9	79.7	85.6	H	1,600	515	2,100	10-20	100	
DD-10	11/22/77	0.0	7.1	7.1	8.1	48.0	56.1	H	1,600	380	1,520	10-20	100	Re-fracture
RR-4	11/30/77	6.1	9.2	15.3	8.9	23.6	32.5	H	1,600	700	2,800	10-20	900	Re-fracture
HH-14	12/15/77	0.0	7.2	7.2	0.7	70.1	70.8	H	1,600	850	3,400	10-20	N/A	
FF-14	5/19/78	0.6	8.9	9.5	0.0	86.4	86.4	H	1,600	900	3,600	10-20	N/A	
HH-18	5/20/78	0.0	9.4	9.4	0.0	82.6	82.6	H	1,300	760	3,000	10-20	N/A	
LL-14	5/22/78	0.0	7.2	7.2	1.5	45.7	42.7	H	1,600	400	1,600	10-20	N/A	Re-fracture
JJ-14	5/22/78	0.2	11.1	11.3	5.9	48.7	54.6	H	1,600	400	1,600	10-20	N/A	Re-fracture

H = Fractured with high viscosity fluid.
L = Fractured with low viscosity fluid.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077-49

TABLE 3

Oil Well Stimulation Results (Continued)

Well No.	Treatment Date	Test Data						Fracture Fluid Viscosity	Treatment Size					
		Test Prior			Test After				Gelled Water		Sand		Sand Removed From Well	
		BO/D	BW/D	BF/D	BO/D	BW/D	BF/D		Pad (Gal.)	Body (Gal.)	Pounds	Mesh	Lbs.	Comments
F-2	12/10/79	2.1	5.9	8.0	16.7	14.7	31.4	H	1,600	300	1,200	10-20	495	
F-8	1/29/80	0.5	15.7	16.2	0.5	16.3	16.8	H	1,600	450	1,800	10-20	N/A	
J-10	1/30/80	1.0	7.6	8.6	6.6	137.7	144.3	H	1,600	500	2,000	10-20	660	
L-6	1/16/80	2.6	19.0	21.6	29.5	82.5	112.0	H	1,600	1175	4,700	10-20	330	
L-10	1/23/80	1.2	30.8	32.0	11.8	92.7	104.5	H	1,600	950	3,800	10-20	330	
P-10	1/23/80	3.7	61.2	64.9	7.4	134.1	141.5	H	1,600	1175	4,700	10-20	660	
R-0	1/17/80	0.7	15.0	15.7	10.3	153.7	164.0	H	1,600	475	1,500	10-20	330	
R-10	1/24/80	1.5	54.5	56.0	11.8	129.7	141.5	H	1,600	1150	4,500	10-20	495	
V-2	1/17/80	1.5	19.5	21.0	17.7	135.6	153.3	H	1,600	400	1,600	10-20	330	
LL-12	1/08/80	0.7	67.2	67.9	1.5	151.8	153.3	H	1,600	826	3,300	10-20	825	
H-2	9/18/80	1.4	5.5	6.9	7.4	28.0	35.4	H	1,600	700	2,800	10-20	N/A	Re-fracture
F-4	9/19/80	0.2	0.8	1.0	1.0	8.6	9.6	H	1,600	325	1,300	10-20	N/A	Re-fracture
J-0	9/25/80	1.2	8.7	9.9	2.8	8.5	11.3	H	1,600	714	2,857	10-20	N/A	Re-fracture
L-4	9/25/80	2.2	22.8	25.0	17.7	128.2	145.9	H	1,600	798	3,192	10-20	N/A	
L-0	9/29/80	0.6	13.3	13.9	5.9	156.2	162.1	H	1,600	750	3,000	10-20	N/A	
R-2	9/30/80	1.0	12.6	13.6	14.8	179.0	193.8	H	1,600	420	1,680	10-20	N/A	
L-8	9/30/80	3.7	19.7	23.4	19.2	79.5	98.7	H	1,600	1320	5,280	10-20	N/A	
D-8	10/03/80	0.9	7.4	8.3	3.3	9.9	13.2	H	1,600	900	3,600	10-20	N/A	
V-8	10/03/80	0.5	6.9	7.4	14.8	86.9	101.7	H	1,600	600	2,400	10-20	N/A	
F-10	10/08/80	0.6	6.1	6.7	1.9	13.5	15.4	H	1,600	550	2,200	10-20	N/A	Re-fracture
T-14	10/08/80	1.5	18.1	19.6	4.4	194.6	199.0	H	1,600	1200	4,800	10-20	N/A	
P-12	10/09/80	1.0	38.2	39.2	7.4	92.8	100.2	H	1,600	1380	5,520	10-20	N/A	
B-14	10/15/80	3.9	29.7	33.6	32.4	143.0	175.4	H	1,600	900	3,600	10-20	N/A	

H = Fractured with high viscosity fluid.
L = Fractured with low viscosity fluid.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077-49

TABLE 4

Injection Well Transient Tests

Well No.	Stimulation		Skin Factor, S							Mobility, K/u (md/cp)						
			Water (12/76)	Slug (4/77)	Slug (10/77)	Slug (3/78)	Slug (10/78)	1156 ppm Polymer (6/79)	800 ppm Polymer (8/80)	Water (12/76)	Slug (4/77)	Slug (10/77)	Slug (3/78)	Slug (10/78)	1156 ppm Polymer (6/79)	800 ppm Polymer (8/80)
S-7	S, F[1]	BU[2]	-4.0	-1.2	-2.1	-3.5	0.74	-2.1	-2.2	10.4	8.1	4.8	2.4	4.0	2.4	1.6
		FO[2]	-2.5	0.6	-3.0	-3.2	0.64	-3.3	-2.2	7.1	5.3	5.4	2.3	4.0	1.8	1.2
GG-13	S, F	BU	-2.7	-2.6	3.4	-2.4	-2.23	-2.7	-1.8	7.8	1.0	2.5	0.6	1.8	1.1	2.0
		FO	-3.0	1.4	6.9	-2.6	-0.75	-2.9	-3.3	6.2	3.0	3.5	0.5	2.7	1.2	1.4
C-3	S, F	BU	-3.1	-2.5	1.5	1.6	-0.19	-3.6	-2.1	5.0	1.0	2.3	1.4	1.7	3.8	2.7
		FO	-3.2	3.7	-2.7	-3.8	-4.18	-3.8	-2.3	6.5	2.5	0.7	0.4	0.4	3.2	2.6
QQ-13	F, F	BU	-4.9	-5.1	-4.7	-4.4	-4.08	-4.2	-4.1	2.7	0.6	0.7	0.9	2.5	3.4	7.5
		FO	-4.8	-5.0	-4.6	-4.7	-4.69	-5.3	-4.7	3.8	0.8	0.6	0.6	2.5	2.3	8.1
O-13	S	BU	-4.1	0.7	-2.3	-2.4	2.67	--*	1.8	5.8	3.2	0.9	1.1	4.5	--*	2.3
		FO	-3.5	-2.0	-3.4	-2.7	-1.31	-3.5	-1.6	5.2	2.2	0.8	1.7	2.8	1.9	2.8
I-7	S, F	BU	-3.7	-2.6	-3.1	-2.9	-1.55	-2.0	-2.1	4.6	3.4	1.4	1.7	1.8	1.3	0.63
		FO	-4.0	-2.4	1.0	-0.5	-1.08	-2.4	-1.4	3.9	3.5	3.7	3.3	2.5	1.2	0.99

[1]S = Shot, F = Fracture
[2]BU = Buildup, FO = Fall Off

*Data uninterpretable

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077-49

TABLE 5

Pressure Monitoring - Oil Wells

Well No.	Test Date	Test Type	Mobility k/u, md/cp	Skin Factor s	Wellbore Radius, rw, ft	Isogeometric Permeability k, md	Net Thickness h, ft	Stimulation
D-4	11/76	Buildup	6.4	2.4				None
	12/77	Buildup	1.3	-5.2	0.25	75	12	Frac
	11/78	Buildup	1.1	-5.6				
	8/79	Buildup	0.5	-4.8				
	9/80	Buildup	0.6	-4.4				
H-8	11/76	Buildup	2.6	0.9				None
	11/77	Buildup	5.4	-4.9	0.25	80	28	Frac
	11/78	Buildup	2.0	-5.7				
	8/79	Buildup	3.6	-3.8				
	9/80	Buildup	0.6	-3.7				
P-12	11/76	Buildup	11.3	-1.3				Shot
	12/77	Buildup	4.1	-3.6	0.25	100	46	Shot
	11/78	Buildup	1.8	-5.3				
	8/79	Buildup	2.2	-3.3				
	9/80	Buildup	1.1	-1.0				
PP-12	11/76	Buildup	1.9	0.8				None
	12/77	Buildup	5.9	-6.5	0.25	75	27	Frac
	11/78	Buildup	6.2	-6.7				
	8/79	Buildup	2.0	-5.6				
	9/80	Buildup	4.4	-3.9				
HH-12	11/76	Buildup	5.5	1.7				None
	11/77	Buildup	19.8	-6.4	0.25	90	21	Frac
	11/78	Buildup	9.4	-6.3				
	8/79	Buildup	8.8	-4.9				
	9/80	Buildup	4.7	-4.5				

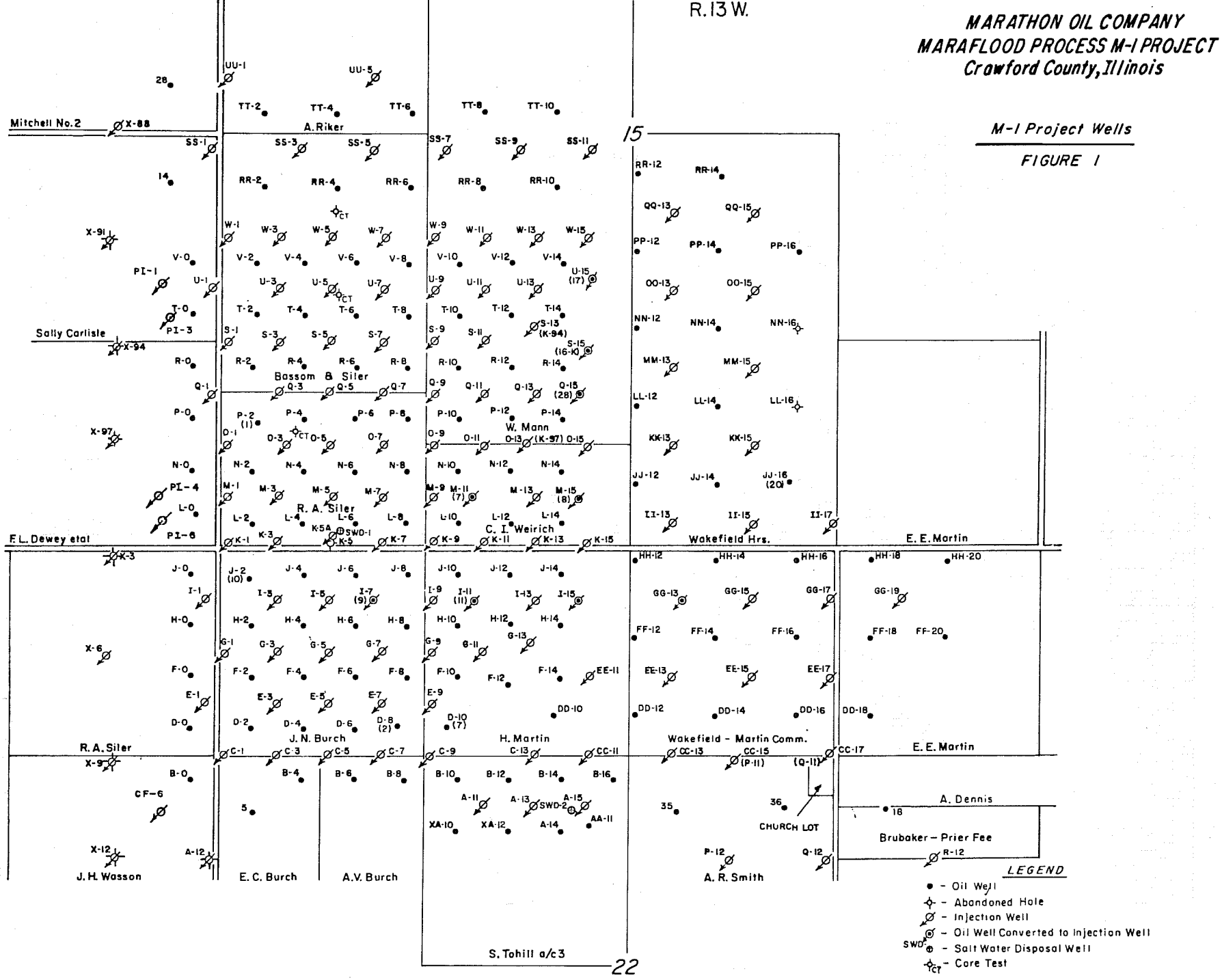
MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077-49

TABLE 6

Tritiated Water Injection Wells

	Isogeometric Permeability k, md	Net Thickness h, ft	Pre-Slug Stimulation*	Well Status	Dosage Curies
2.5 Acre					
A-13	85	21	S, ST	New well	10
E-5	115	11	S, H	New well	5
I-7	75	29	S, L	Conv. oil well	10
K-13	85	29	S	New well	10
O-13	100	54	S	Conv. WF inj.	20
M-5	70	46	S, ST	New well	15
S-5	30	16	S, ST	New well	5
5.0 Acre					
GG-15	90	39	S	New well	25
SS-3	65	21	G, H	New well	15
QQ-13	60	32	G, H	New well	25

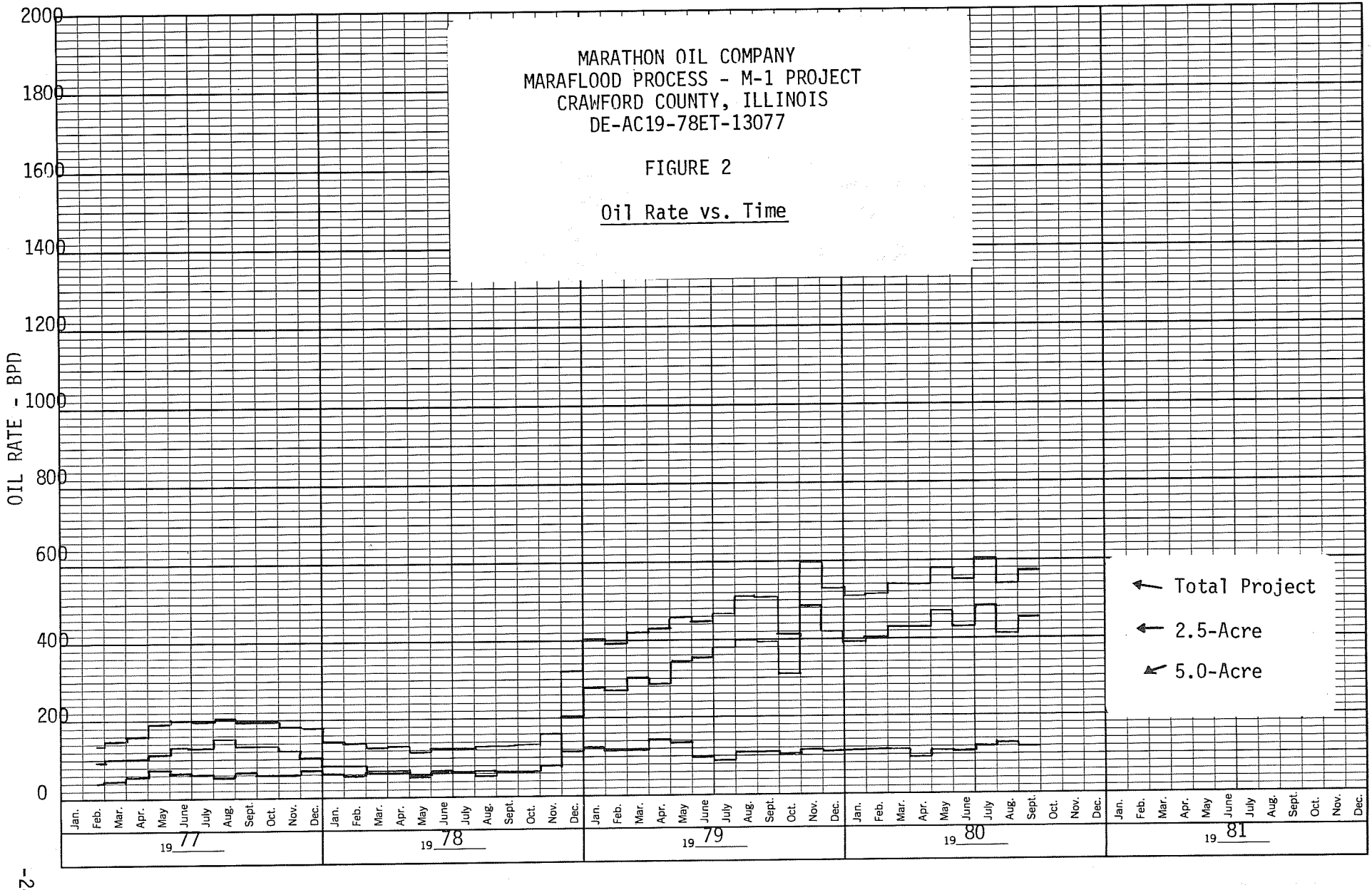
*G = Gauge
S = Shot
L = Fractured with low viscosity fluids
H = Fractured with high viscosity fluids
ST = Staged frac with moth balls


R.13W.
MARATHON OIL COMPANY
MARAFLOOD PROCESS M-I PROJECT
Crawford County, Illinois
M-I Project Wells
FIGURE 1
T. 6 N.
15
22
Mitchell No.2
A. Riker
Sally Carlisle
Bassom & Siler
W. Mann
R. A. Siler
C. I. Weirich
F. L. Dewey etal
Wakefield Hrs.
E. E. Martin
J. N. Burch
H. Martin
Wakefield - Martin Comm.
R. A. Siler
E. E. Martin
A. Dennis
Brubaker - Prier Fee
CHURCH LOT
J. H. Wasson
E. C. Burch
A. V. Burch
A. R. Smith
S. Tohill a/c3
LEGEND
- Oil Well
- Abandoned Hole
- Injection Well
- Oil Well Converted to Injection Well
- Salt Water Disposal Well
- Core Test

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077

FIGURE 2

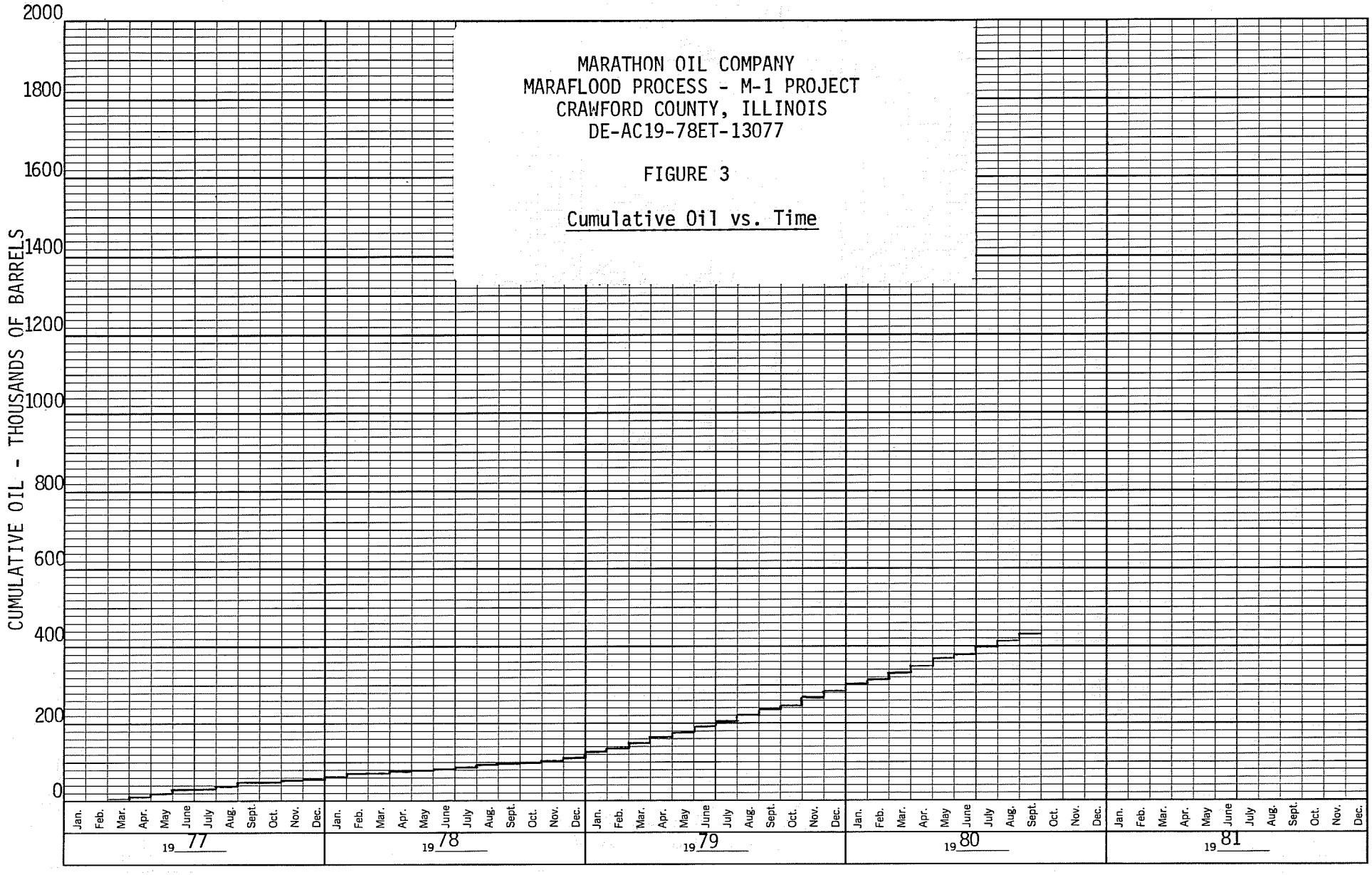
Oil Rate vs. Time



MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077

FIGURE 3

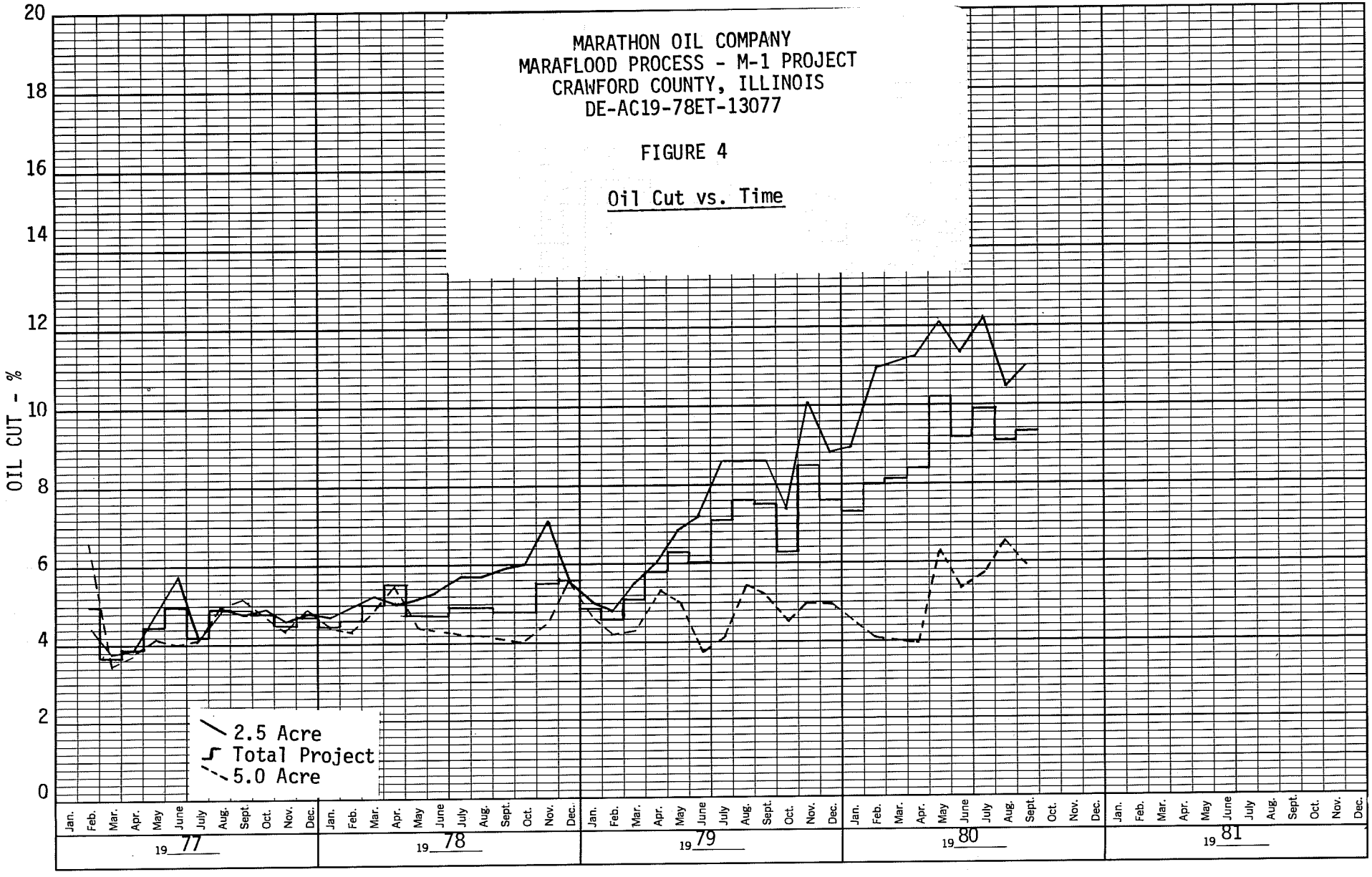
Cumulative Oil vs. Time



MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077

FIGURE 4

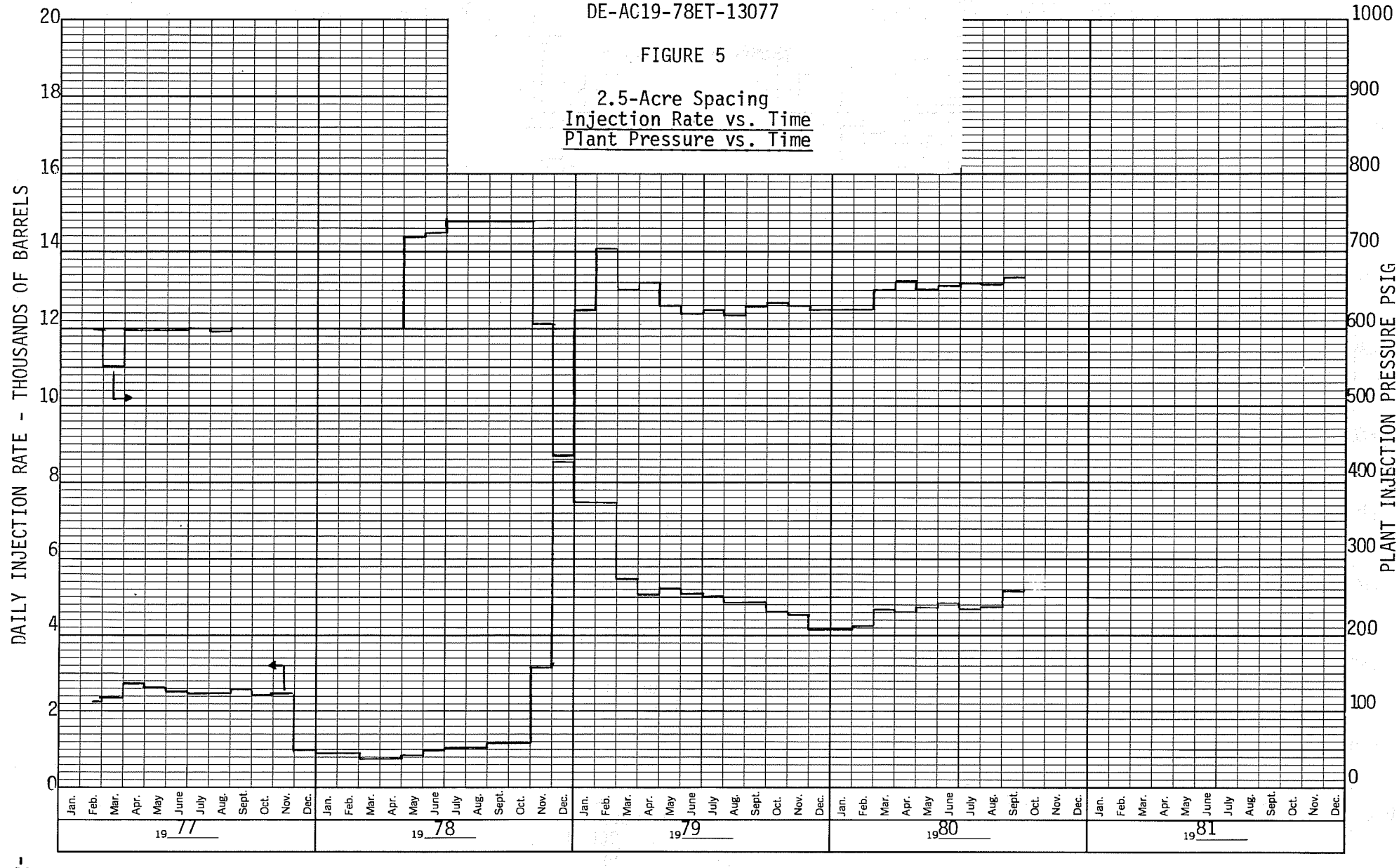
Oil Cut vs. Time



MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077

FIGURE 5

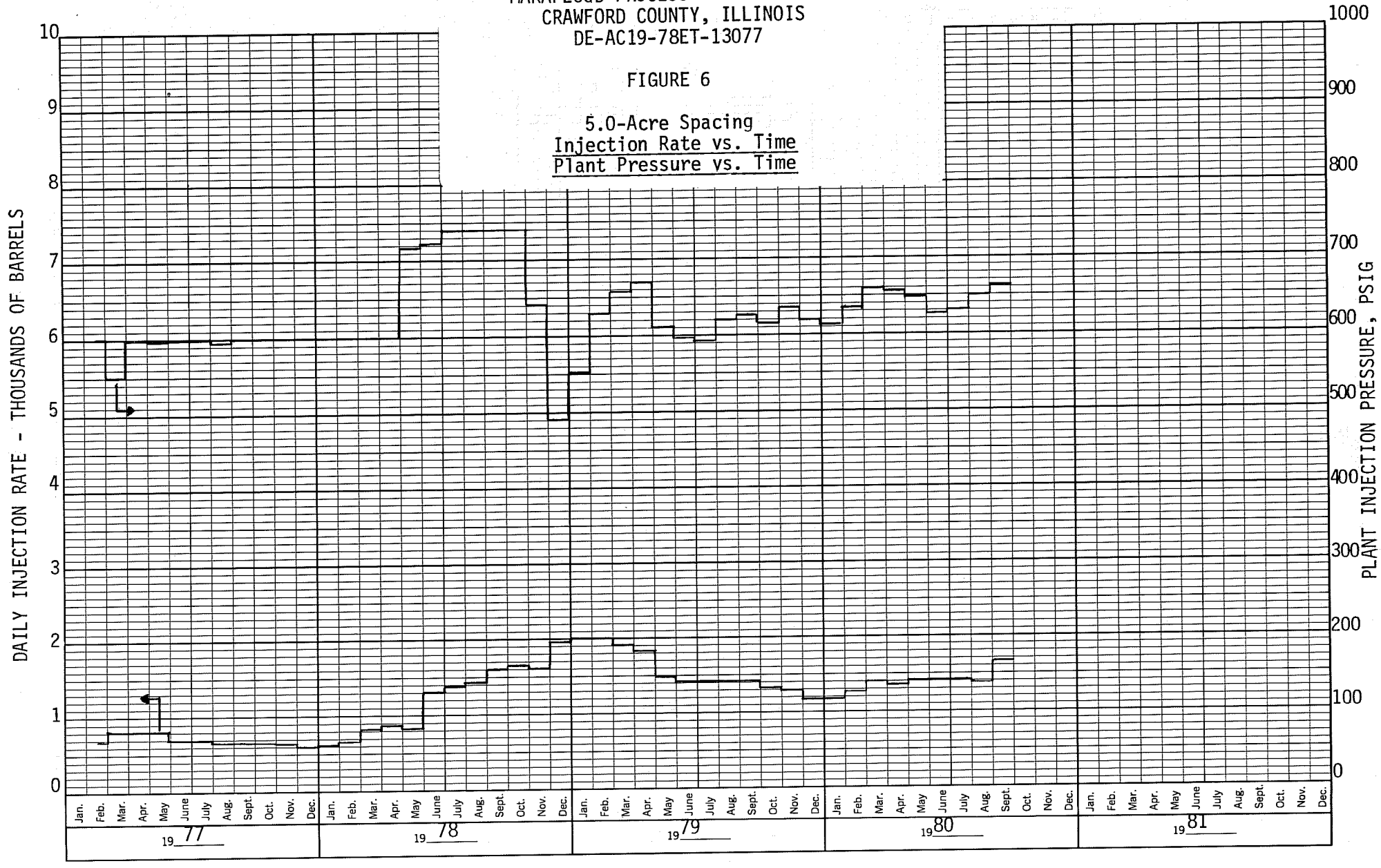
2.5-Acre Spacing
Injection Rate vs. Time
Plant Pressure vs. Time

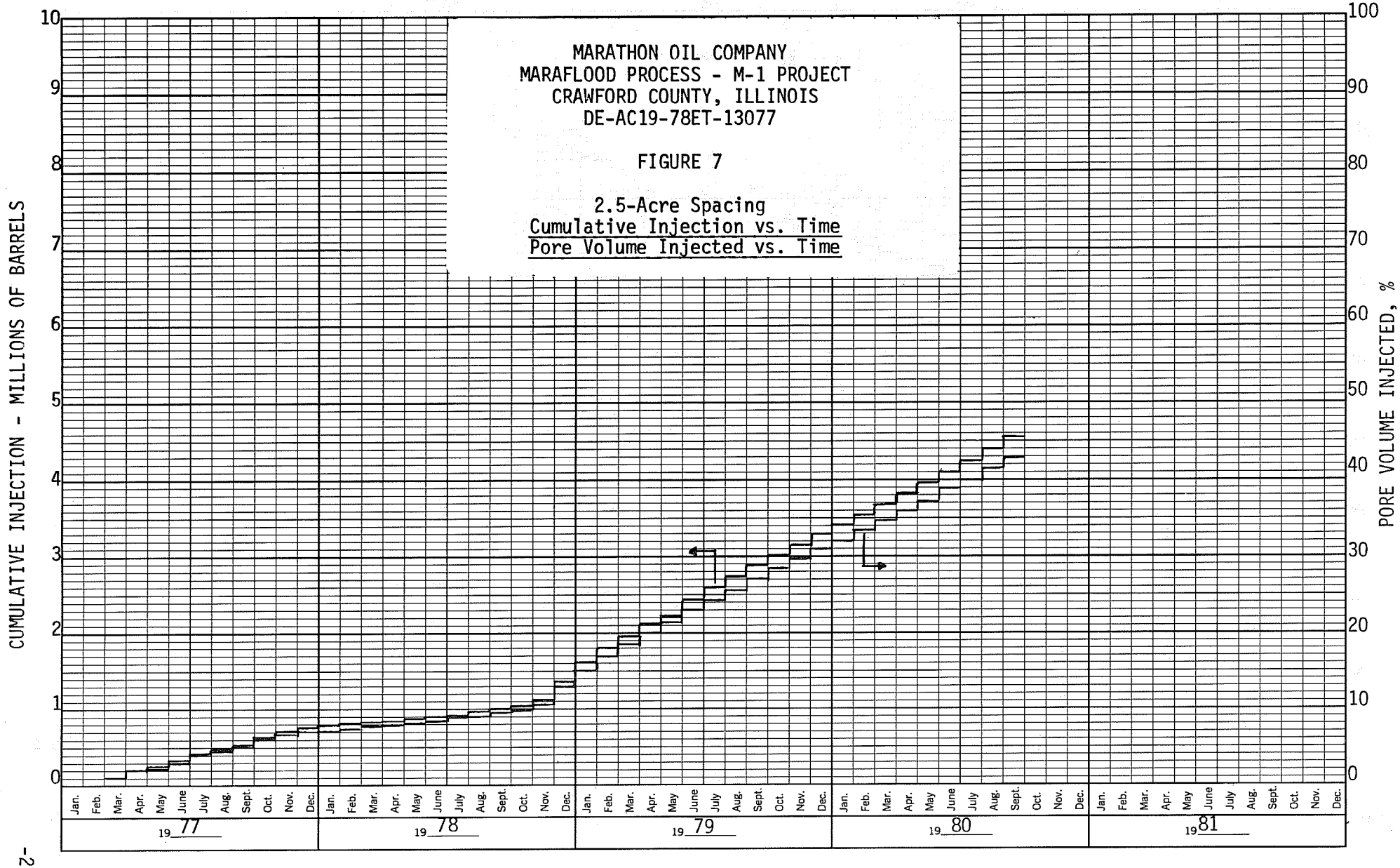


MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077

FIGURE 6

5.0-Acre Spacing
Injection Rate vs. Time
Plant Pressure vs. Time

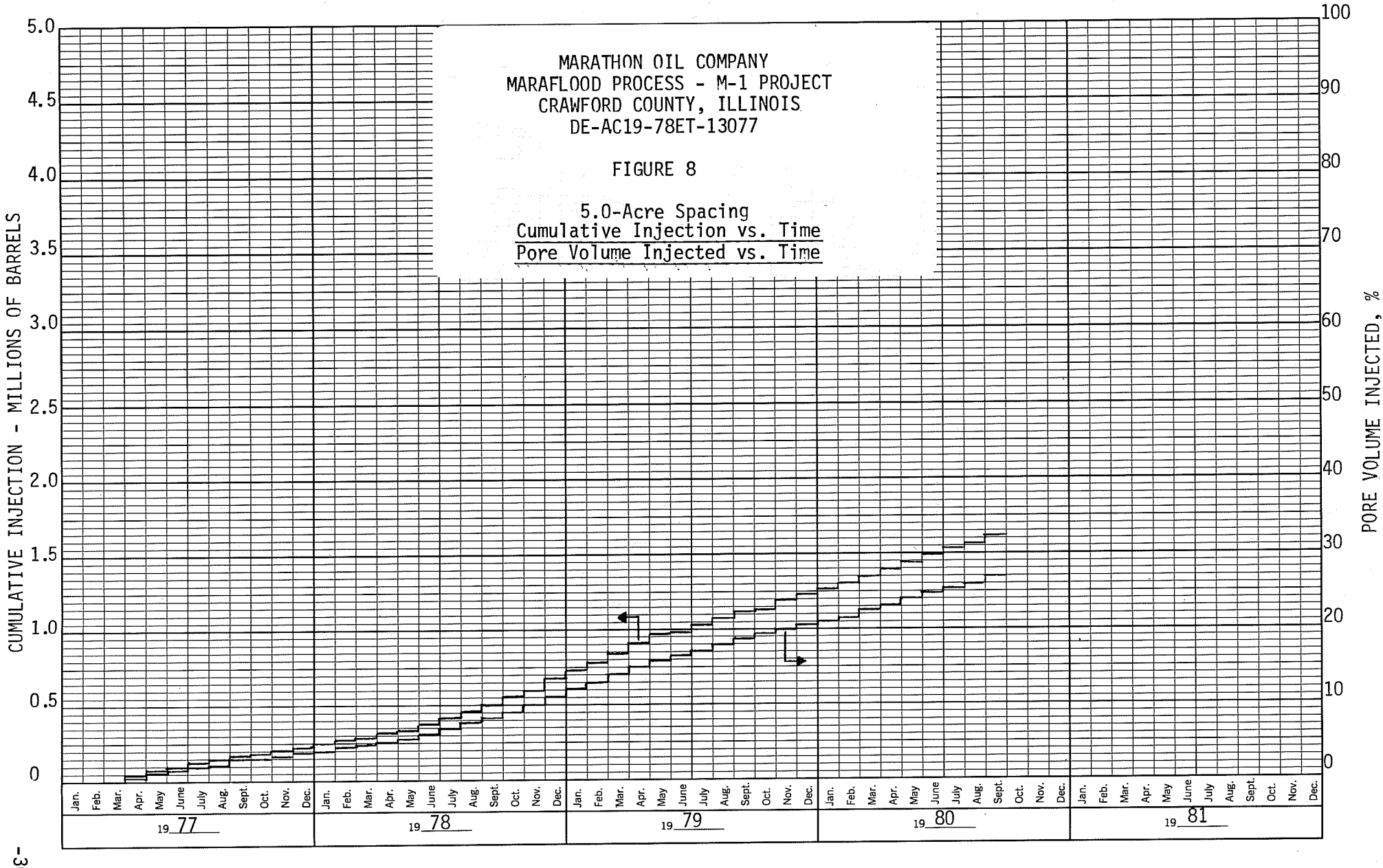


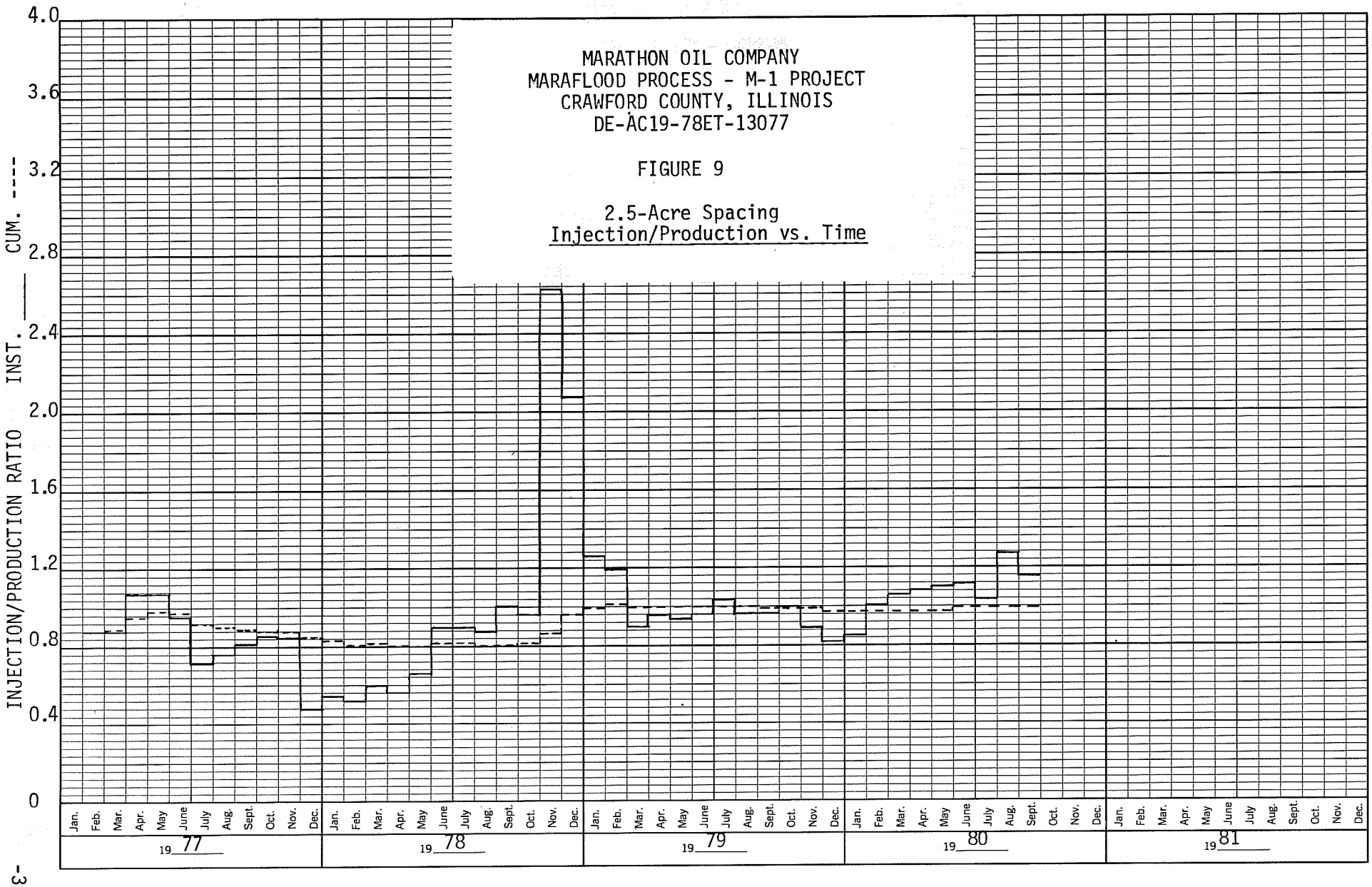

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077
FIGURE 7
2.5-Acre Spacing
Cumulative Injection vs. Time
Pore Volume Injected vs. Time
CUMULATIVE INJECTION - MILLIONS OF BARRELS
PORE VOLUME INJECTED, %
0
1
2
3
4
5
6
7
8
9
10
0
10
20
30
40
50
60
70
80
90
100
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
19 77
19 78
19 79
19 80
19 81

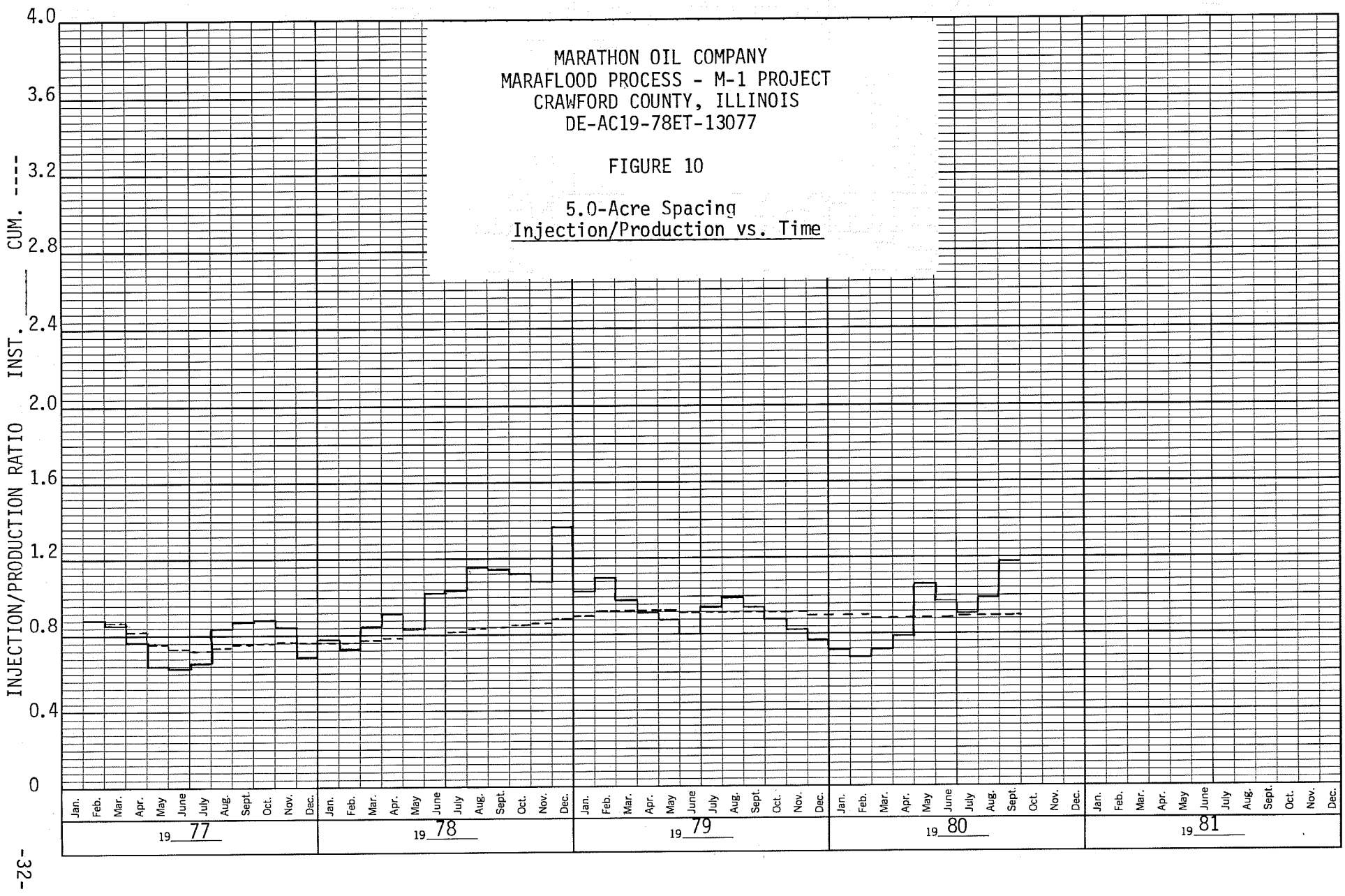
MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077

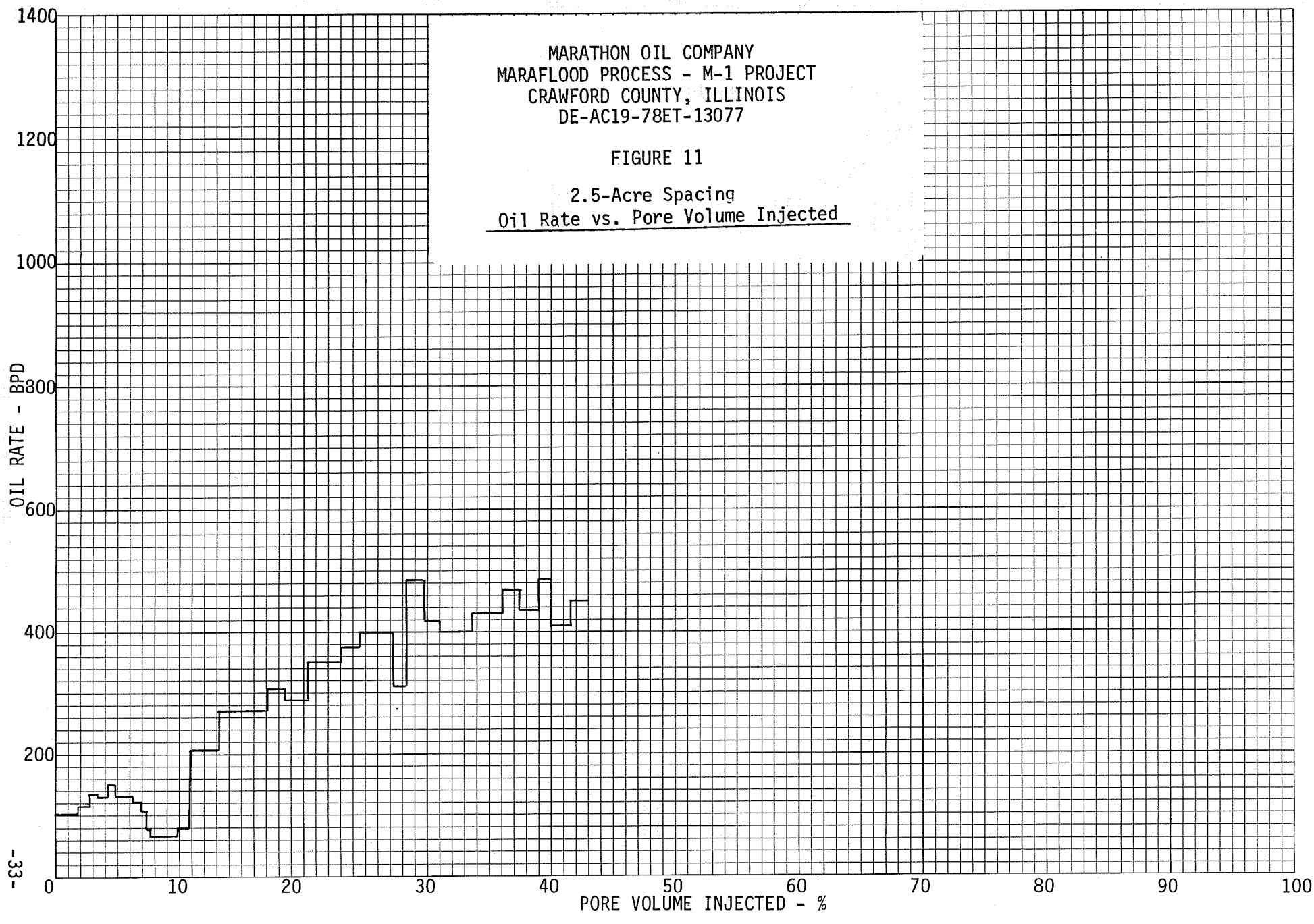
FIGURE 8

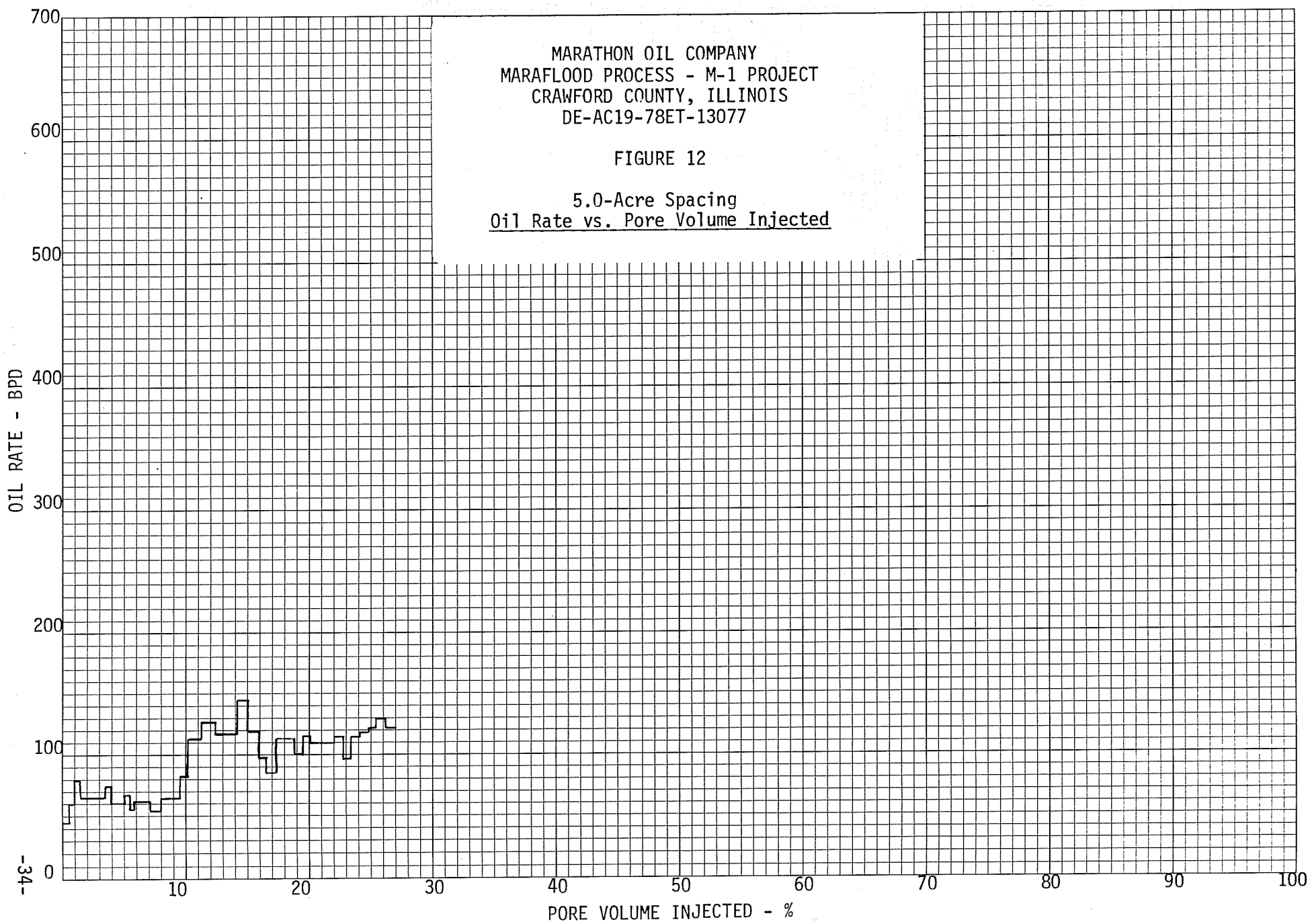
5.0-Acre Spacing
Cumulative Injection vs. Time
Pore Volume Injected vs. Time




MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077
FIGURE 9
2.5-Acre Spacing
Injection/Production vs. Time
INJECTION/PRODUCTION RATIO INST. ____ CUM. ----
4.0
3.6
3.2
2.8
2.4
2.0
1.6
1.2
0.8
0.4
0
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
19 77
19 78
19 79
19 80
19 81


MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077
FIGURE 10
5.0-Acre Spacing
Injection/Production vs. Time
INJECTION/PRODUCTION RATIO INST. ____ CUM. ----
4.0
3.6
3.2
2.8
2.4
2.0
1.6
1.2
0.8
0.4
0
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
19 77
19 78
19 79
19 80
19 81

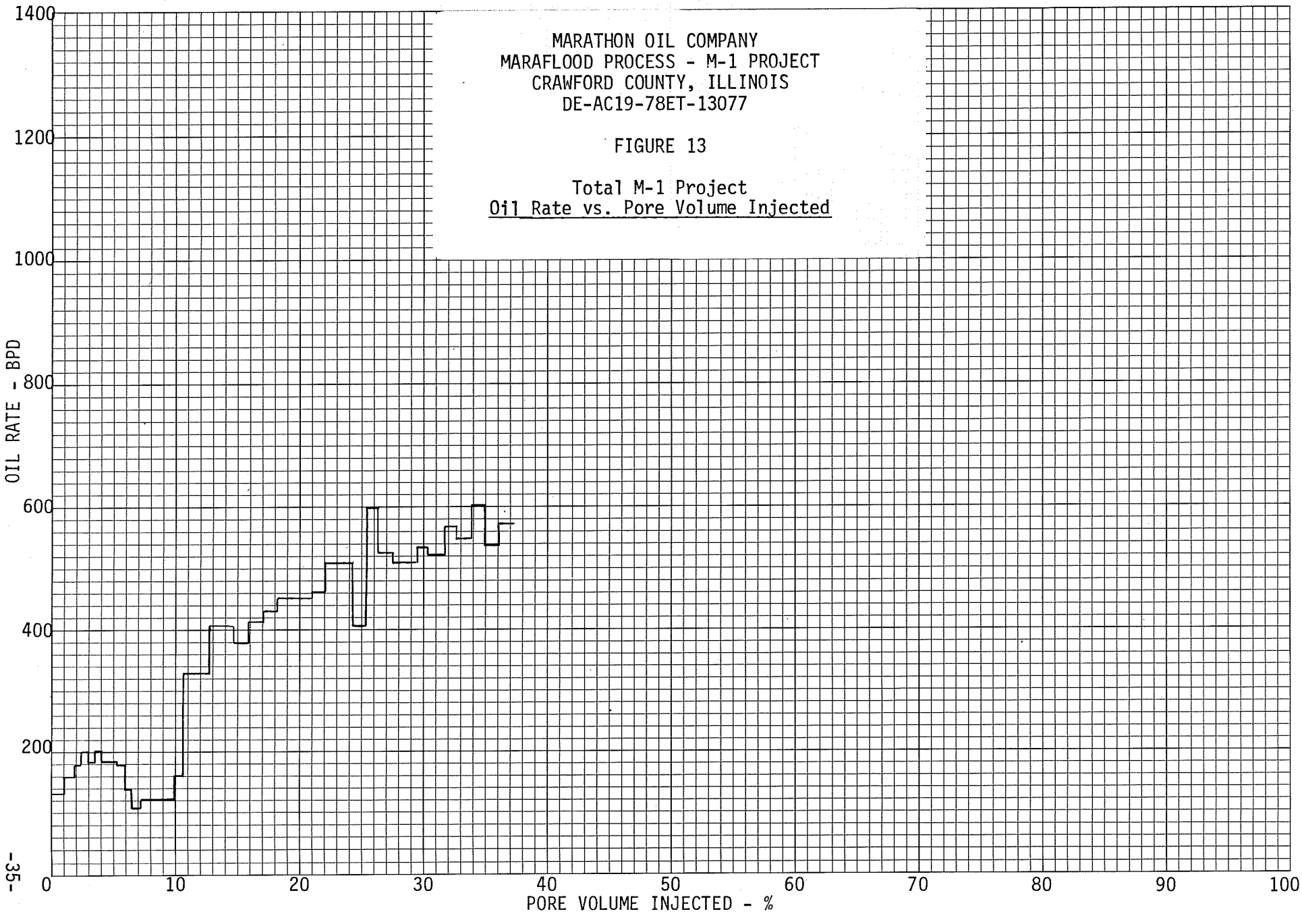

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077
FIGURE 11
2.5-Acre Spacing
Oil Rate vs. Pore Volume Injected
OIL RATE - BPD
1400
1200
1000
800
600
400
200
0
10
20
30
40
50
60
70
80
90
100
PORE VOLUME INJECTED - %

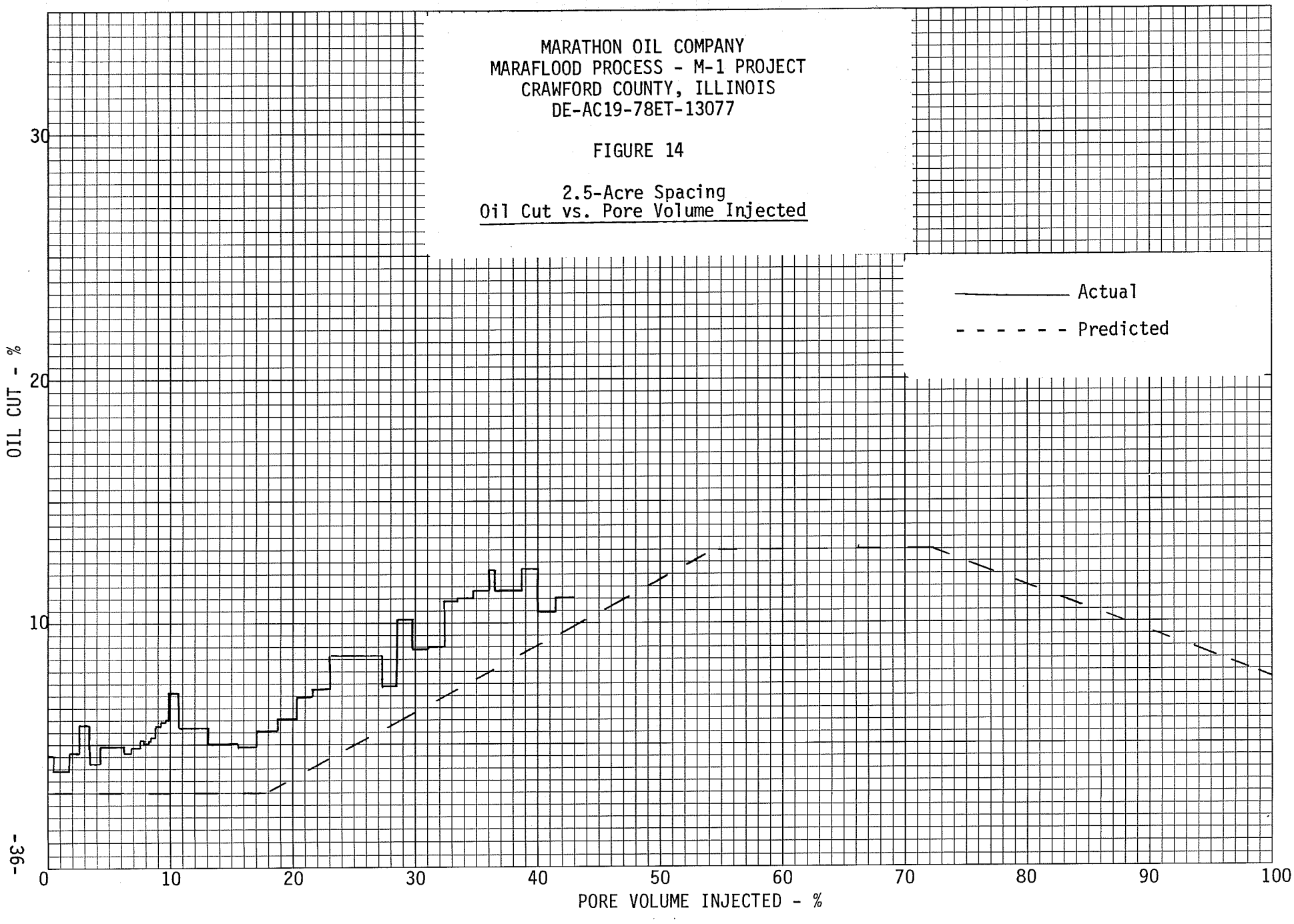

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077
FIGURE 12
5.0-Acre Spacing
Oil Rate vs. Pore Volume Injected
OIL RATE - BPD
PORE VOLUME INJECTED - %
0
100
200
300
400
500
600
700
10
20
30
40
50
60
70
80
90
100

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077

FIGURE 13

Total M-1 Project
Oil Rate vs. Pore Volume Injected

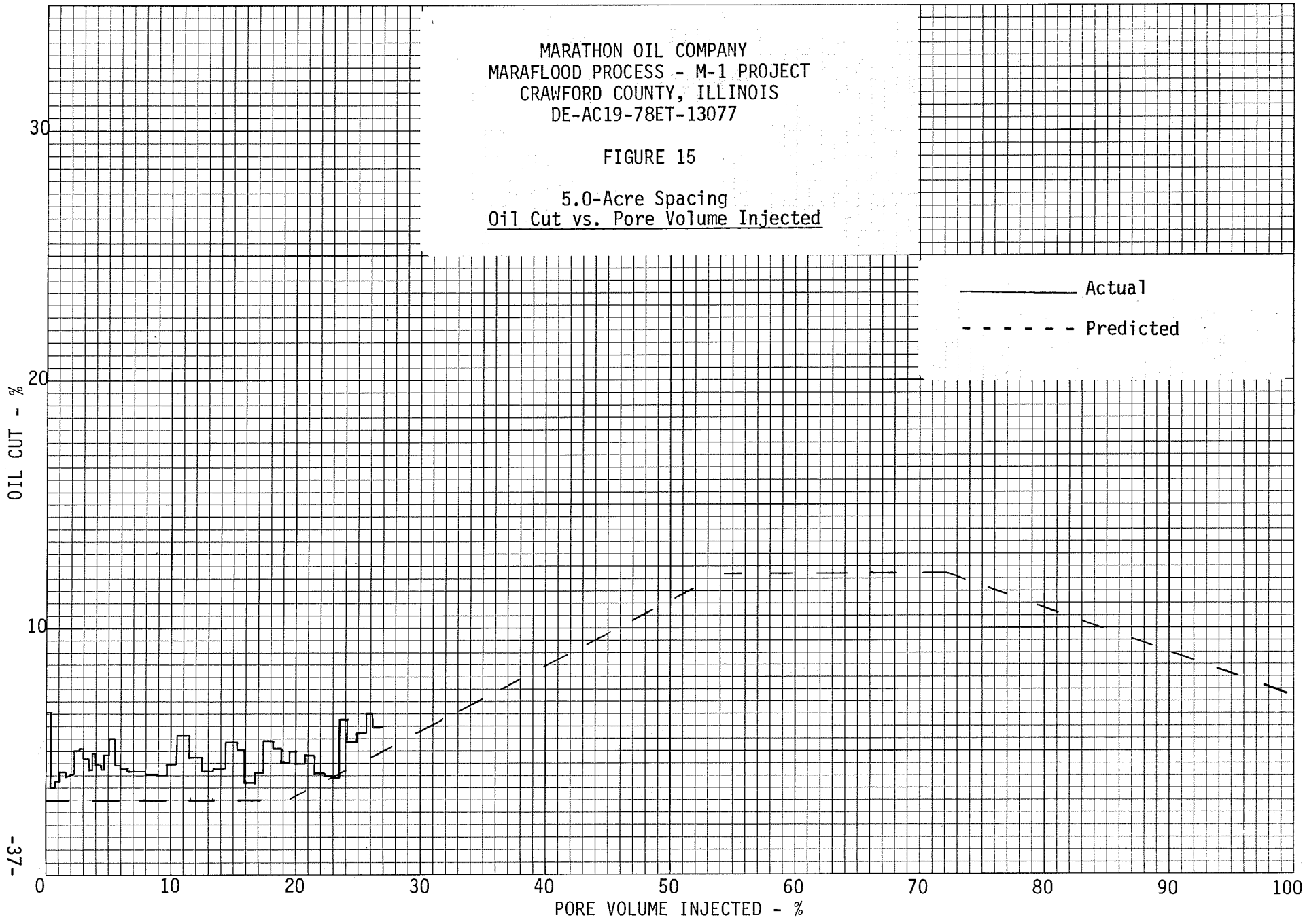



MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077
FIGURE 14
2.5-Acre Spacing
Oil Cut vs. Pore Volume Injected
Actual
Predicted
OIL CUT - %
30
20
10
0
10
20
30
40
50
60
70
80
90
100
PORE VOLUME INJECTED - %

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077

FIGURE 15

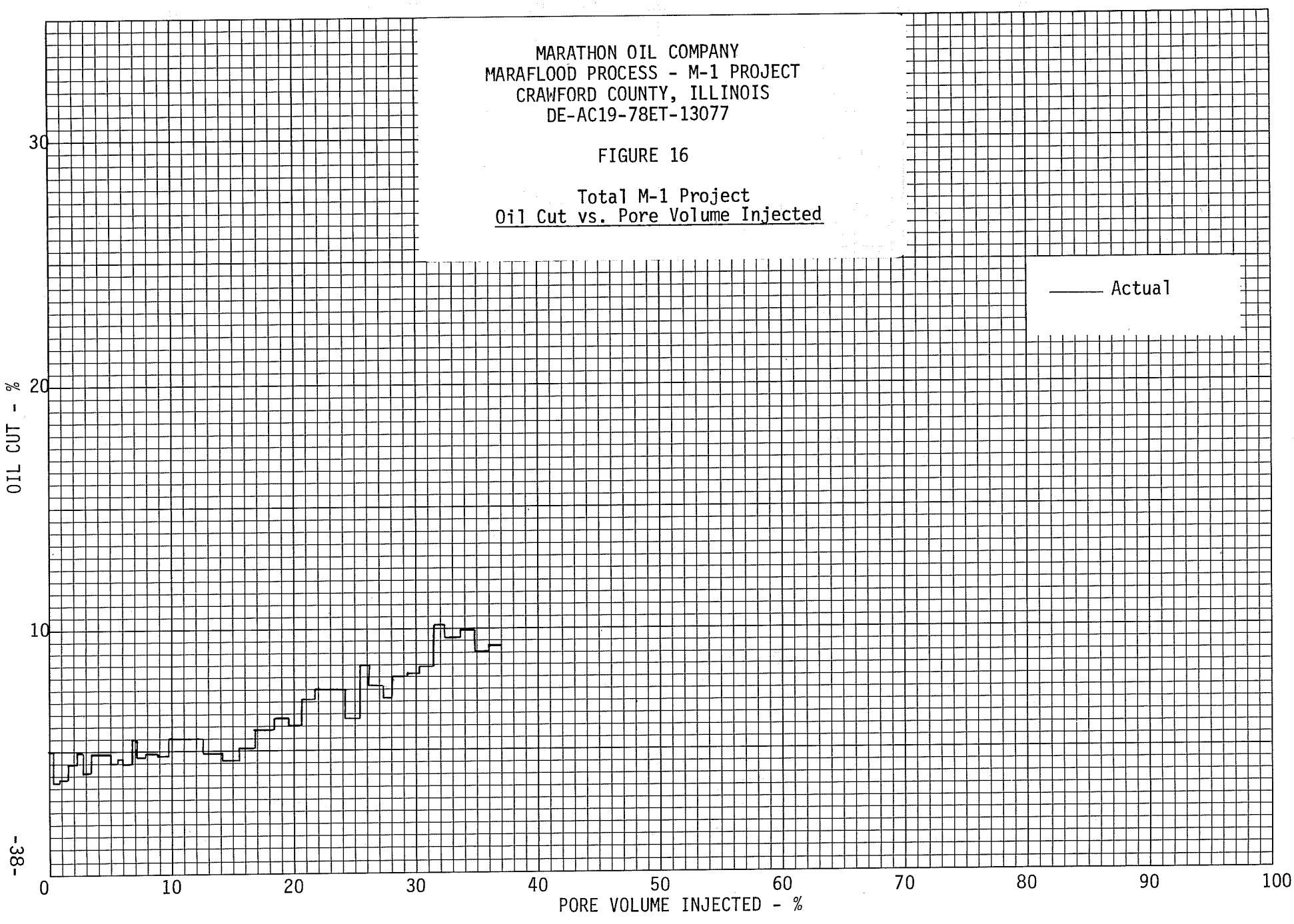
5.0-Acre Spacing
Oil Cut vs. Pore Volume Injected



MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077

FIGURE 16

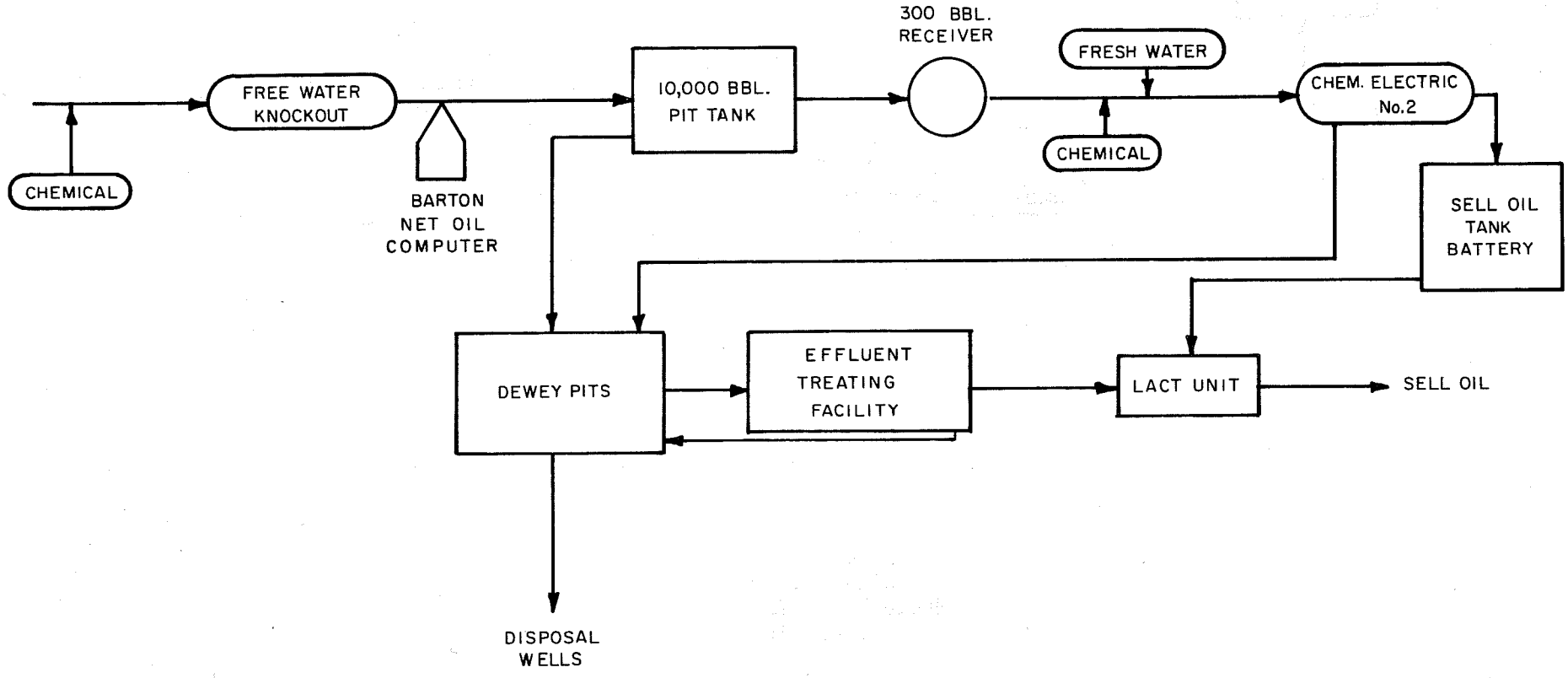
Total M-1 Project
Oil Cut vs. Pore Volume Injected



MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077

Figure 17

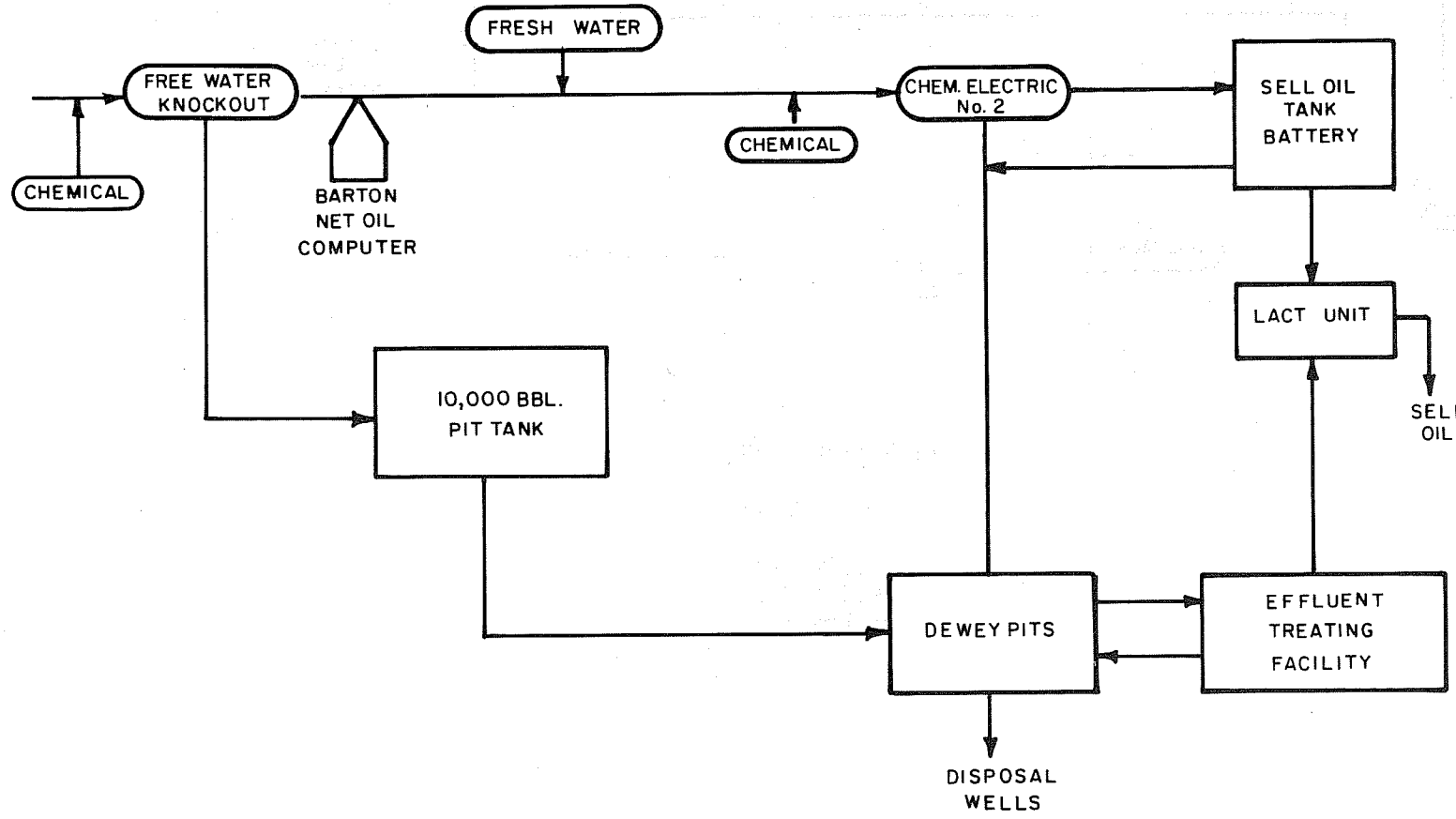
Schematic of 2.5-Acre Production Treating Facility



MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077

Figure 18

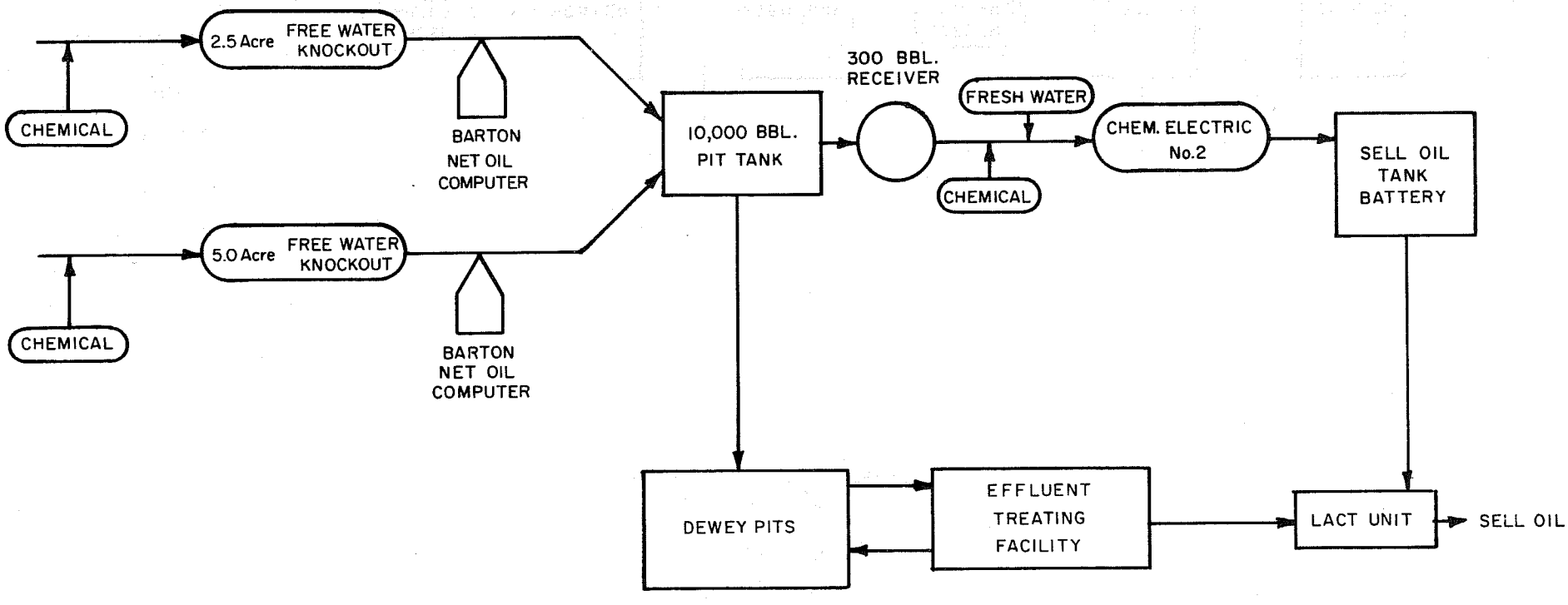
Schematic of 5.0-Acre Production Treating Facility



MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077

Figure 19

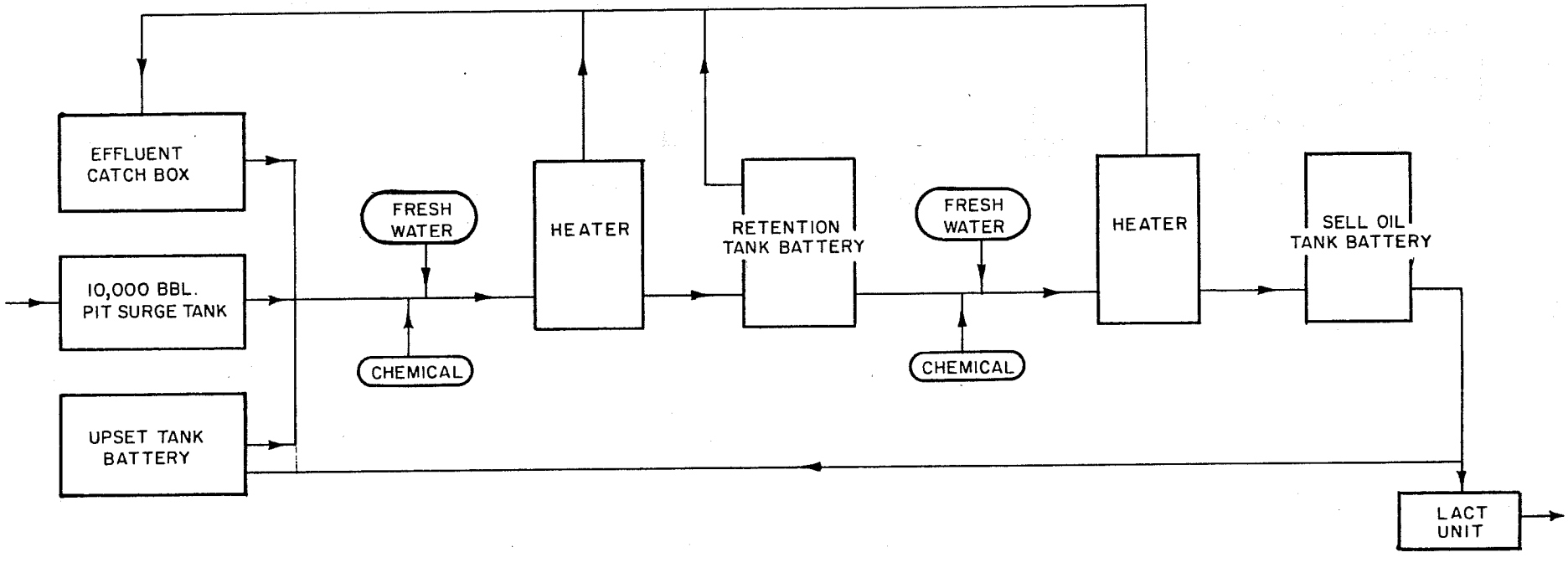
Schematic of 2.5 and 5.0-Acre
Combined-Stream Production Facility



MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
CRAWFORD COUNTY, ILLINOIS
DE-AC19-78ET-13077

Figure 20

Schematic of M-1
Emulsion Treating Facility



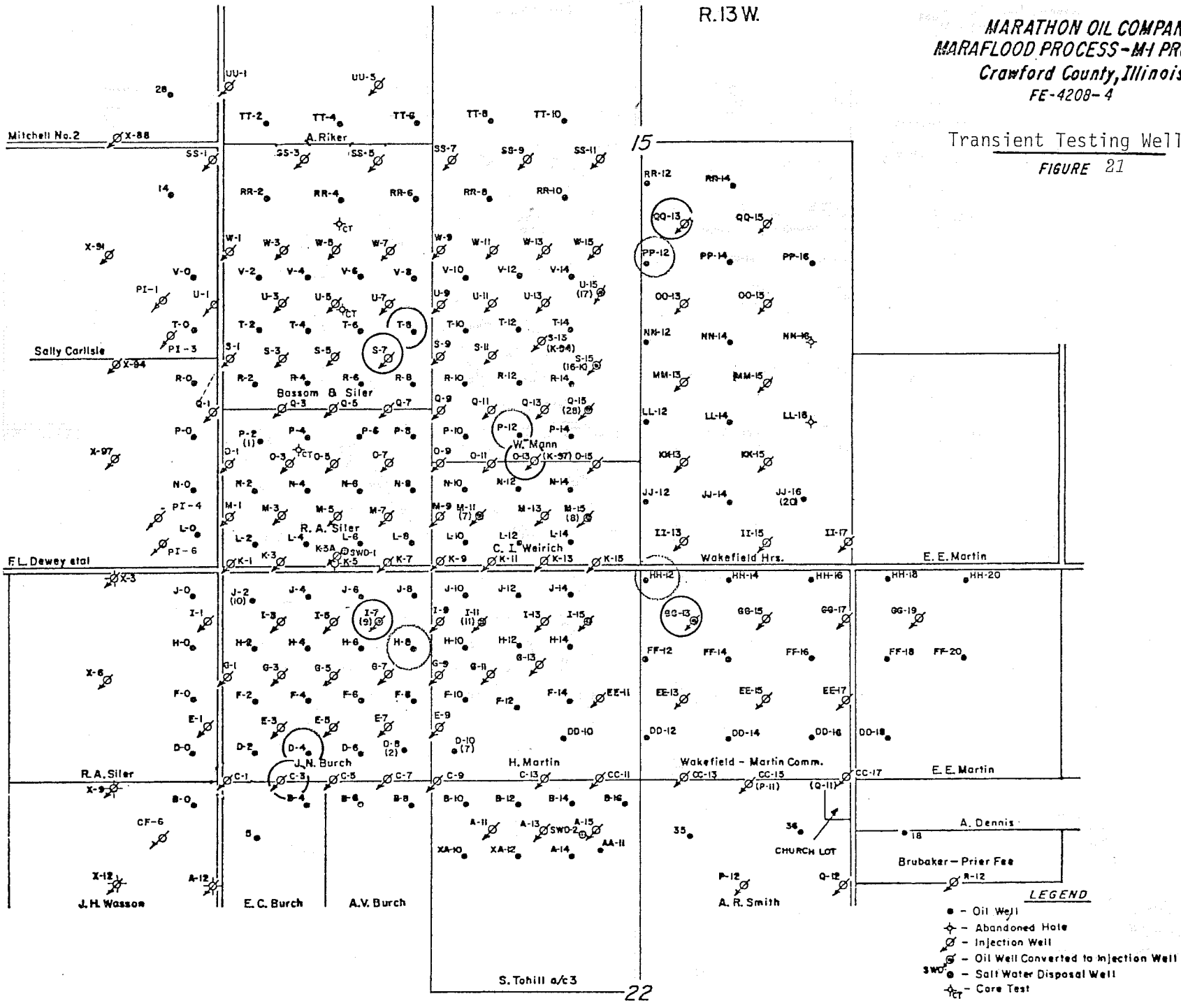
T. 6 N.

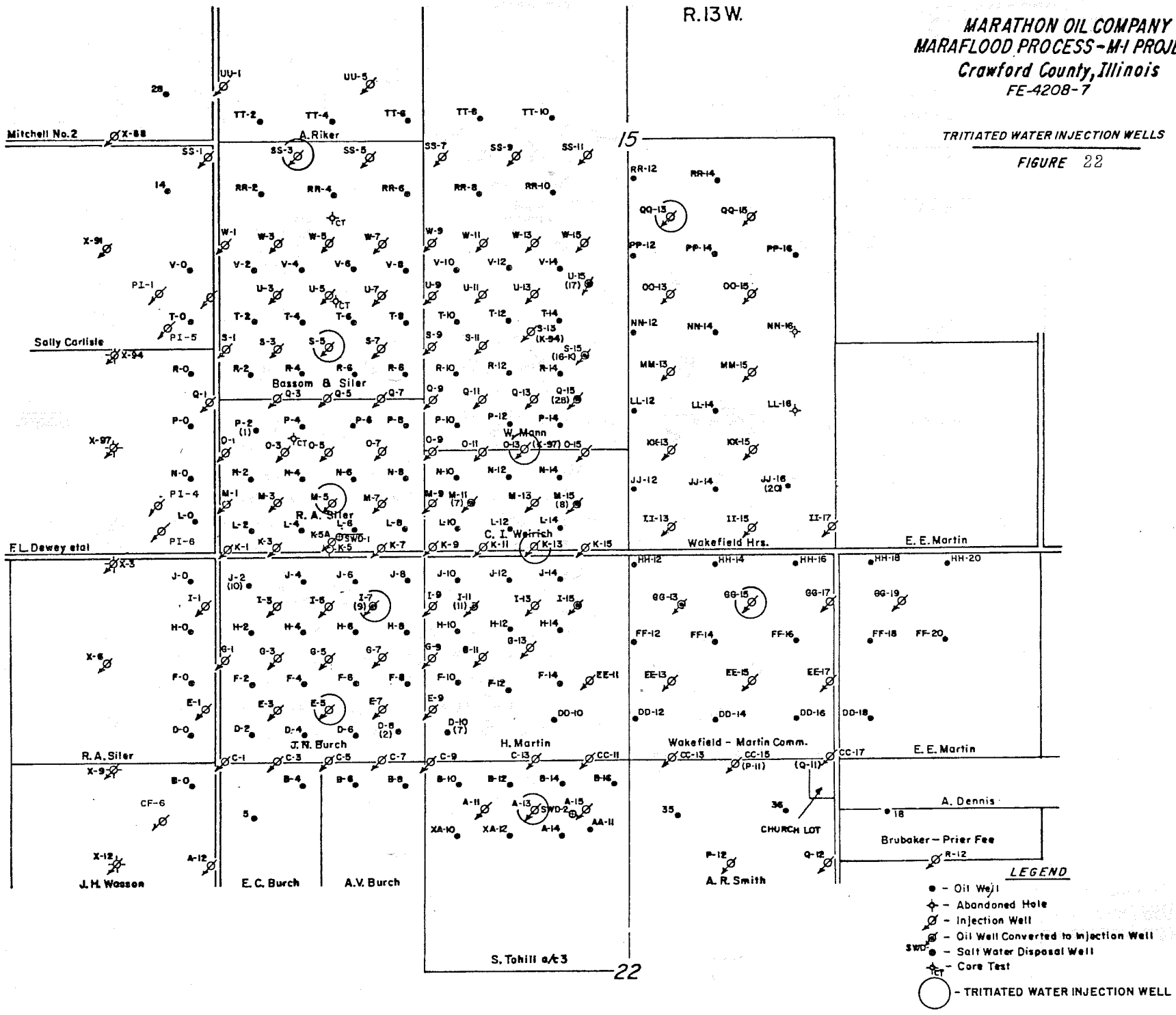
R. 13 W.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-I PROJECT
Crawford County, Illinois
FE-4208-4

Transient Testing Wells

FIGURE 21





MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-I PROJECT
Crawford County, Illinois
FE-4208-7

TRITIATED WATER INJECTION WELLS

FIGURE 22

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE PATTERN
DATA SUMMARY

MONTH AND YEAR	INJ. RATE (B/D)	CUM. INJ. (BBLS)	% CUM.INJ./ PORE VOL.	WGTD. AVG. BHP.	CUMULATIVE (BHP*DAYS)	INJ. (B/D) /BHP	% POLY CUT	% SLUG CUT	% OIL CUT	OIL RATE (B/D)	INJ./ PROD. RATIO	WGTD.AVG. CHLD.CONT. (PPM)	VISC. (CP)	SCREEN FACTOR
FEB. 1977	2246	40428	0.4	588	10584	3.82	0.0	0.09	4.5	102	0.89	9586	36.0	0.0
MAR. 1977	2392	114580	1.1	633	30207	3.78	0.0	0.39	3.8	102	0.90	9709	30.7	0.0
APR. 1977	2547	190990	1.8	665	50157	3.83	0.0	0.07	3.9	103	1.08	9179	32.5	0.0
MAY 1977	2642	279108	2.6	653	70400	4.05	0.0	0.11	4.7	117	1.08	9282	35.5	0.0
JUN. 1977	2488	353736	3.3	628	89240	3.96	0.0	0.14	5.8	136	0.96	9469	34.4	0.0
JUL. 1977	2487	430820	4.1	630	108770	3.95	0.0	0.08	4.2	129	0.73	8954	31.9	0.0
AUG. 1977	2451	506787	4.8	633	128393	3.87	0.0	0.12	4.9	150	0.77	9185	35.3	0.0
SEP. 1977	2372	577961	5.4	621	147023	3.82	0.0	0.10	4.8	132	0.82	9524	32.1	0.0
OCT. 1977	2418	652907	6.1	612	165995	3.95	0.0	0.07	4.9	132	0.86	9495	32.6	0.0
NOV. 1977	2448	726345	6.8	525	181745	4.66	0.0	0.13	4.6	122	0.85	9773	31.0	0.0
DEC. 1977	977	756628	7.1	433	195168	2.26	0.0	0.13	4.8	106	0.48	9358	30.0	0.0
JAN. 1978	928	785397	7.4	456	209304	2.04	0.0	0.27	4.7	81	0.55	8814	28.9	0.0
FEB. 1978	912	810925	7.6	440	221624	2.07	0.0	0.17	4.9	80	0.54	9550	28.0	0.0
MAR. 1978	791	835457	7.9	428	234892	1.85	0.0	0.12	5.2	66	0.60	9488	27.0	0.0
APR. 1978	730	857365	8.1	444	248212	1.64	0.0	0.22	5.0	62	0.56	10033	26.7	0.0
MAY 1978	825	882933	8.3	522	264394	1.58	0.0	0.21	5.1	58	0.66	9604	59.3	0.0
JUN. 1978	994	912743	8.6	522	280054	1.90	0.0	0.24	5.3	65	0.90	9534	69.6	0.0
JUL. 1978	1030	944661	8.9	494	295368	2.09	0.0	0.26	5.7	65	0.91	9818	77.1	0.0
AUG. 1978	1017	976185	9.2	512	311240	1.99	0.0	0.29	5.7	67	0.88	9764	79.4	0.0
SEP. 1978	1084	1008699	9.5	516	326720	2.10	0.0	0.31	5.9	67	1.01	10277	78.7	0.0
OCT. 1978	1114	1043246	9.8	492	341972	2.26	0.0	0.41	6.0	66	0.97	10185	71.4	0.0
NOV. 1978	3162	1138100	10.7	722	363632	4.64	0.0	0.32	7.1	80	2.63	9452	54.1	22.9
DEC. 1978	8247	1393747	13.1	852	390044	9.68	0.0	0.47	5.6	206	2.08	10191	52.3	28.4
JAN. 1979	7480	1625621	15.3	816	415340	9.17	0.0	0.54	5.0	275	1.27	9589	51.1	29.6
FEB. 1979	7436	1811525	17.0	791	435115	9.40	0.0	0.49	4.8	271	1.19	9445	52.0	28.7
MAR. 1979	5454	1980605	18.6	702	456877	7.77	0.0	0.92	5.5	306	0.90	9072	52.5	29.9
APR. 1979	5020	2131216	20.1	762	479737	6.59	0.0	1.10	6.0	287	0.97	9275	54.9	28.7
MAY 1979	5018	2286412	21.5	774	503731	6.48	0.0	1.58	6.9	341	0.94	9364	36.1	23.3
JUN. 1979	5099	2439395	23.0	791	527461	6.45	0.0	1.97	7.2	352	0.97	9426	31.4	23.3
JUL. 1979	4977	2593670	24.4	858	554059	5.80	0.0	2.48	8.6	378	1.04	9626	31.5	24.8
AUG. 1979	4865	2744493	25.8	856	580595	5.68	0.0	2.91	8.6	400	0.96	9220	33.2	24.8
SEP. 1979	4820	2889080	27.2	863	606485	5.59	0.0	3.89	8.6	395	0.97	9204	30.0	23.8
OCT. 1979	4598	3031613	28.5	842	632587	5.46	2.77	3.86	7.3	310	1.00	8673	30.2	25.8
NOV. 1979	4524	3167322	29.8	851	658117	5.32	2.03	4.60	10.1	483	0.89	8652	32.0	25.6
DEC. 1979	4168	3296543	31.0	833	683940	4.99	3.84	4.26	8.8	418	0.82	8512	30.6	22.5
JAN. 1980	4147	3425101	32.2	819	709329	5.06	4.73	3.81	8.9	398	0.86	8466	30.9	21.9
FEB. 1980	4217	3547393	33.4	800	732529	5.27	1.83	5.06	10.9	404	1.00	8618	30.1	24.0
MAR. 1980	4631	3690934	34.7	873	759592	5.30	5.40	6.16	11.0	425	1.06	8130	29.5	20.8
APR. 1980	4571	3828057	36.0	861	785422	5.31	4.41	7.36	11.3	431	1.08	8103	29.3	22.0
MAY 1980	4716	3974314	37.4	889	812981	5.30	8.35	5.69	12.1	463	1.10	7852	30.2	23.2

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE PATTERN
DATA SUMMARY

MONTH AND YEAR	INJ. RATE (B/D)	CUM. INJ. (BBLS)	% CUM.INJ./ PORE VOL.	WGTD. AVG. BHP.	CUMULATIVE (BHP*DAYS)	INJ. (B/D) /BHP	% POLY CUT	% SLUG CUT	% OIL CUT	OIL RATE (B/D)	INJ./ PROD. RATIO	WGTD.AVG. CHLD.CONT. (PPM)	VISC. (CP)	SCREEN FACTOR
JUN. 1980	4837	4119350	38.8	926	840761	5.22	10.81	5.61	11.3	437	1.11	7616	28.0	21.4
JUL. 1980	4646	4263438	40.1	915	869126	5.08	11.83	5.49	12.2	484	1.04	7503	28.8	21.5
AUG. 1980	4690	4408805	41.5	912	897398	5.14	10.52	4.67	10.4	408	1.27	7761	19.2	18.5
SEP. 1980	5165	4563717	42.9	975	926648	5.30	17.16	4.99	11.0	452	1.15	7023	19.2	19.7

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE PATTERN
DATA SUMMARY

MONTH AND YEAR		INJ. RATE (B/D)	CUM. INJ. (BBLS)	% CUM.INJ./ PORE VOL.	WGTD. AVG. BHP.	CUMULATIVE (BHP*DAYS)	INJ. (B/D) /BHP	% POLY CUT	% SLUG CUT	% OIL CUT	OIL RATE (B/D)	INJ./ PROD. RATIO	WGTD.AVG. CHLD.CONT. (PPM)	VISC. (CP)	SCREEN FACTOR
FEB.	1977	675	12150	0.2	585	10530	1.15	0.0	0.15	6.6	44	0.90	8319	36.0	0.0
MAR.	1977	822	37632	0.6	575	28535	1.43	0.0	0.33	3.5	44	0.87	9776	30.7	0.0
APR.	1977	826	62412	1.0	634	47375	1.30	0.0	0.24	3.7	60	0.78	9920	32.5	0.0
MAY	1977	818	88069	1.5	633	66998	1.29	0.0	0.28	4.2	79	0.65	9918	35.5	0.0
JUN.	1977	738	110196	1.8	624	85718	1.18	0.0	0.26	4.0	68	0.64	8551	34.4	0.0
JUL.	1977	709	132173	2.2	648	105806	1.09	0.0	0.20	4.1	65	0.67	9221	31.9	0.0
AUG.	1977	666	152823	2.5	579	123755	1.15	0.0	0.18	5.0	65	0.85	9560	35.3	0.0
SEP.	1977	652	172381	2.9	603	141845	1.08	0.0	0.15	5.1	67	0.88	9132	32.1	0.0
OCT.	1977	670	193151	3.2	589	160104	1.14	0.0	0.12	4.7	64	0.89	10556	32.6	0.0
NOV.	1977	647	212554	3.5	543	176394	1.19	0.0	0.19	4.3	62	0.86	8089	31.0	0.0
DEC.	1977	622	231830	3.9	564	193878	1.10	0.0	0.11	4.9	74	0.69	9517	30.0	0.0
JAN.	1978	627	251261	4.2	564	211362	1.11	0.0	0.21	4.4	62	0.79	9362	28.9	0.0
FEB.	1978	670	270012	4.5	560	227042	1.20	0.0	0.18	4.3	59	0.74	9503	28.0	0.0
MAR.	1978	810	295132	4.9	614	246076	1.32	0.0	0.15	4.8	63	0.85	10260	27.0	0.0
APR.	1978	862	320987	5.4	615	264526	1.40	0.0	0.15	5.5	68	0.92	11115	26.7	0.0
MAY	1978	823	346499	5.8	570	282196	1.44	0.0	0.20	4.4	56	0.84	10177	59.3	0.0
JUN.	1978	1302	385567	6.4	576	299476	2.26	0.0	0.21	4.3	63	1.03	12675	69.9	0.0
JUL.	1978	1382	428403	7.1	639	319285	2.16	0.0	0.23	4.2	62	1.04	10269	77.1	0.0
AUG.	1978	1402	471866	7.9	723	341698	1.94	0.0	0.27	4.2	57	1.16	9885	79.4	0.0
SEP.	1978	1599	519836	8.7	755	364348	2.12	0.0	0.24	4.1	63	1.15	10537	78.7	0.0
OCT.	1978	1642	570751	9.5	782	388590	2.10	0.0	0.37	4.0	67	1.13	10336	71.4	0.0
NOV.	1978	1610	619060	10.3	819	413160	1.97	0.0	0.26	4.5	82	1.09	9995	49.8	22.9
DEC.	1978	1978	680367	11.3	843	439293	2.35	0.0	0.32	5.6	115	1.37	9881	51.7	27.2
JAN.	1979	2007	742572	12.4	840	465333	2.39	0.0	0.62	4.7	129	1.04	10111	51.3	28.2
FEB.	1979	2024	793171	13.2	851	486608	2.38	0.0	0.64	4.2	119	1.11	10080	51.8	26.7
MAR.	1979	1927	852907	14.2	857	513175	2.25	0.0	0.90	4.3	117	0.99	9982	52.5	28.8
APR.	1979	1812	907262	15.1	845	538525	2.14	0.0	0.86	5.3	144	0.92	10289	55.6	27.6
MAY	1979	1486	953342	15.9	761	562116	1.95	0.0	0.93	5.0	119	0.89	10348	56.0	28.9
JUN.	1979	1425	996090	16.6	768	585156	1.86	0.0	0.86	3.7	99	0.80	10113	54.1	28.8
JUL.	1979	1406	1039687	17.3	792	609708	1.78	0.0	0.88	4.1	87	0.95	9996	54.1	29.6
AUG.	1979	1418	1083641	18.1	804	634632	1.76	0.0	0.75	5.4	112	0.99	9603	54.4	28.7
SEP.	1979	1417	1126151	18.8	829	659502	1.71	0.0	1.13	5.2	111	0.95	10451	51.1	27.9
OCT.	1979	1332	1167457	19.5	809	684581	1.65	0.0	0.89	4.5	101	0.89	9314	52.1	30.5
NOV.	1979	1296	1206352	20.1	813	708971	1.59	0.0	1.45	5.1	115	0.83	9993	51.1	29.8
DEC.	1979	1174	1242731	20.7	789	733430	1.49	0.0	1.14	4.9	110	0.77	9896	51.7	27.8
JAN.	1980	1182	1279404	21.3	787	757827	1.50	0.0	0.92	4.5	110	0.72	9993	39.4	23.4
FEB.	1980	1261	1315963	21.9	753	779664	1.67	0.0	0.93	4.0	111	0.68	9790	30.7	21.2
MAR.	1980	1393	1359156	22.7	868	806572	1.60	0.0	1.52	4.0	114	0.72	9816	29.3	19.7
APR.	1980	1354	1399726	23.3	839	831742	1.61	0.0	2.78	3.9	97	0.79	9849	30.5	22.2
MAY	1980	1410	1443464	24.1	877	858929	1.61	0.0	1.09	6.3	116	1.06	10239	29.9	21.5

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE PATTERN
DATA SUMMARY

MONTH AND YEAR	INJ. RATE (B/D)	CUM. INJ. (BBLS)	% CUM.INJ./ PORE VOL.	WGTD. AVG. BHP.	CUMULATIVE (BHP*DAYS)	INJ. (B/D) /BHP	% POLY CUT	% SLUG CUT	% OIL CUT	OIL RATE (B/D)	INJ./ PROD. RATIO	WGTD.AVG. CHLD.CONT. (PPM)	VISC. (CP)	SCREEN FACTOR
JUN. 1980	1408	1485710	24.8	893	885719	1.58	0.0	1.49	5.3	109	0.98	9773	29.5	21.3
JUL. 1980	1404	1529241	25.5	892	913371	1.57	0.0	1.35	5.7	121	0.91	10069	29.9	21.3
AUG. 1980	1373	1571844	26.2	860	940031	1.60	0.0	1.32	6.5	130	0.98	9637	28.3	21.0
SEP. 1980	1648	1621322	27.0	924	967751	1.78	0.0	1.31	5.9	122	1.18	9548	27.9	21.5

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE INJECTION REPORT
SEPTEMBER 1980 (30 DAYS)

WELL		DAYS ACTIVE	(FT) NET SAND	PRESS	(BBLS) PORE VOL	****PERCENT INJECTED**** PV SLUG	PV 1156	PV 800	PV 625	PV TOTAL	PREV MON. RATE	(B/D) CURRENT RATE	REC RATE (B/D)
A-11	*	30	25	670	96308	9.5	10.7	21.9	2.6	44.7	44	36	46
A-13		30	21	380	126637	9.7	11.5	20.3	2.8	44.4	54	61	92
A-15		30	45	400	144717	9.4	12.4	21.4	2.2	45.4	44	55	98
C-1	*	30	37	670	217157	9.7	9.6	17.0	2.6	38.9	93	87	97
C-3	*	30	14	670	65219	8.8	9.0	15.7	1.5	34.9	10	20	30
C-5	*	30	14	670	63152	9.0	8.7	12.5	1.6	31.8	17	16	26
C-7	*	30	13	670	67774	5.8	1.1	2.6	0.4	9.9	4	4	14
C-9	*	30	19	670	78426	9.2	2.5	5.4	0.6	17.9	8	8	18
C-13	*	30	28	670	115337	9.8	13.1	18.2	2.9	44.1	58	47	57
E-1	*	30	18	670	53939	11.5	8.5	14.2	2.1	36.3	18	18	28
E-3		30	11	670	40348	14.7	11.0	19.1	2.8	47.6	19	16	23
E-5		30	11	380	57323	12.0	12.8	24.8	2.6	52.2	29	19	17
E-7		30	31	500	99647	10.6	11.6	20.8	2.6	45.6	48	34	66
E-9	*	30	23	670	90585	10.9	3.2	6.3	0.7	21.0	10	9	19
G-1	*	30	19	670	75828	12.0	6.4	12.9	1.9	33.1	21	23	33
G-3	*	30	26	670	68910	11.6	10.0	16.3	1.1	39.0	5	19	29
G-5		30	32	670	99291	10.1	14.1	17.6	2.6	44.4	43	39	72
G-7		30	31	630	106308	10.5	9.3	19.4	2.6	41.8	25	66	93
G-9	*	30	20	670	74975	11.5	8.2	13.5	1.4	34.6	18	14	24
G-11	*	30	18	670	74257	10.8	10.2	18.8	2.2	42.0	28	24	34
G-13		30	9	560	43871	11.2	8.8	21.8	4.2	46.0	31	27	29
I-1	*	30	20	670	88728	10.2	8.3	17.1	2.6	38.1	43	28	38
I-3		30	21	560	75579	11.5	11.6	18.0	2.7	43.8	34	30	58
I-5		30	30	670	108764	10.0	13.3	16.1	2.5	43.8	39	45	83
I-7	*	22	29	670	107842	10.9	7.4	14.9	1.2	33.5	16	25	35
I-9		30	29	400	96649	9.6	11.7	19.2	3.0	43.6	55	37	75
I-11		30	23	670	84025	9.8	14.7	17.1	2.9	44.5	37	39	61
I-13	*	30	17	670	76063	11.2	12.1	16.8	2.5	42.6	31	29	39
I-15		30	37	620	241350	9.6	10.6	21.6	2.6	44.4	107	90	176
K-1	*	30	20	670	127844	9.5	12.6	16.7	1.9	40.7	39	39	49
K-3		30	40	600	94488	10.0	12.6	18.8	2.2	43.5	26	38	73
K-5A		30	35	440	121286	9.7	12.9	18.2	7.0	47.8	55	223	66
K-7	*	30	39	670	136240	10.4	9.7	17.1	2.6	39.8	59	51	61
K-9	*	30	22	670	100351	10.2	11.5	16.4	2.2	40.3	34	36	46
K-11		30	24	670	98538	9.8	13.4	15.4	4.8	43.4	100	54	78
K-13		30	29	520	121990	9.5	10.6	20.9	3.5	44.5	74	59	88
K-15		30	31	640	172949	9.9	11.8	21.1	3.3	46.0	91	89	110
M-1		30	32	670	111924	9.9	11.8	19.3	3.3	44.3	64	51	82
M-3		30	32	620	114918	10.1	11.4	20.5	1.9	43.9	16	50	87
M-5		30	46	480	161274	10.0	9.2	22.9	4.6	46.6	126	104	98
M-7		30	49	670	175213	9.9	10.9	23.0	2.6	46.4	71	73	108

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE INJECTION REPORT
SEPTEMBER 1980 (30 DAYS)

WELL		DAYS ACTIVE	(FT) NET SAND	PRESS	(RBLS) PORE VOL	****PERCENT INJECTED**** PV SLUG	PV 1156	PV 800	PV 625	PV TOTAL	PREV MON. RATE	(B/D) CURRENT RATE	REC RATE (B/D)
M-9		30	55	670	192610	9.9	11.7	20.8	3.0	45.3	92	84	130
M-11		30	42	670	175452	9.7	10.7	20.5	3.4	44.3	58	132	129
M-13		30	56	520	205655	9.4	8.6	25.7	3.3	46.9	111	104	121
M-15		30	43	640	156515	9.8	12.8	18.9	3.7	45.2	69	115	107
O-1		30	21	540	96744	9.6	12.1	23.7	2.5	47.9	49	27	52
O-3	*	23	23	670	84546	11.3	11.6	3.2	0.1	26.3	1	2	12
O-5		30	47	670	153062	9.9	15.1	17.8	2.9	45.7	63	75	100
O-7		30	47	580	182713	9.9	13.1	19.2	3.2	45.4	103	79	122
O-9		30	48	620	199141	9.8	12.9	19.5	2.7	44.9	23	147	139
O-11		30	53	480	213746	9.7	11.8	20.3	4.5	46.3	65	249	133
O-13		30	54	520	197371	10.0	12.4	19.4	4.2	45.9	88	179	127
O-15		30	46	540	276396	9.8	11.8	19.6	3.2	44.4	153	129	200
Q-1		30	22	600	113178	9.7	12.7	20.8	2.8	45.9	53	46	72
Q-3		30	19	620	73931	10.6	3.8	26.1	6.5	47.0	82	68	43
Q-5	*	28	29	670	99629	10.0	7.1	12.2	0.7	30.0	13	9	19
Q-7		30	48	600	156289	9.8	16.3	15.2	2.1	43.4	51	54	122
Q-9		30	48	540	172632	10.3	11.2	19.3	2.7	43.5	27	123	133
Q-11		30	45	360	178375	9.9	12.5	21.1	3.5	47.1	121	74	103
Q-13		30	37	400	148301	9.9	12.5	19.6	3.5	45.5	102	58	98
Q-15		30	52	620	160565	9.6	11.9	20.5	3.1	45.1	73	84	109
S-1		30	25	420	105303	10.3	10.9	19.5	3.6	44.3	61	60	76
S-3		30	19	670	54587	11.1	11.6	18.0	6.9	47.6	75	45	30
S-5		30	16	540	53993	11.4	10.8	22.6	3.6	48.3	30	30	27
S-7		30	37	260	119153	9.9	12.6	20.6	2.3	45.4	43	46	79
S-9		30	47	280	170003	9.8	13.6	19.6	3.1	46.2	94	70	106
S-11		30	45	460	168556	10.1	11.1	21.3	3.6	46.1	102	86	106
S-13		30	43	480	150413	10.1	12.6	19.0	2.8	44.5	63	69	108
S-15		30	44	460	261128	9.9	11.6	21.2	2.8	45.4	107	128	174
U-1		30	21	560	83646	11.9	9.5	19.8	1.1	42.4	6	25	70
U-3		30	18	620	57713	10.6	9.0	26.6	3.3	49.6	28	32	25
U-5		30	12	520	53089	13.8	9.4	23.0	6.1	52.3	59	45	15
U-7		30	19	640	77484	11.3	10.6	21.0	7.1	50.0	100	77	32
U-9		30	32	380	123821	10.4	12.3	18.9	3.4	45.0	79	55	85
U-11		30	47	500	161693	10.1	12.9	18.1	3.4	44.5	94	79	116
U-13		30	43	540	151555	9.3	9.6	22.5	2.5	43.9	60	62	113
U-15		30	29	500	172084	9.8	12.5	19.8	2.4	44.5	78	50	124
W-1	*	30	26	670	184594	9.6	5.6	15.1	2.4	32.6	48	89	99
W-3	*	30	19	670	125054	9.8	4.2	0.4	1.2	15.7	22	27	37
W-5		30	19	200	65971	10.2	13.4	21.2	1.6	46.4	10	25	40
W-7		30	14	220	86599	9.5	11.9	20.9	3.1	45.5	47	39	57
W-9		30	17	580	89129	9.7	9.9	22.3	3.7	45.7	62	40	58

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE INJECTION REPORT
SEPTEMBER 1980 (30 DAYS)

WELL	DAYS ACTIVE	(FT) NET SAND	PRESS	(BBLS) PORE VOL	****PERCENT INJECTED**** PV SLUG	PV 1156	PV 800	PV 625	PV TOTAL	PREV MON. RATE	(B/D) CURRENT RATE	REC RATE (B/D)
W-11	30	35	640	177292	9.8	11.5	21.5	3.2	46.1	61	123	112
W-13	30	37	640	187643	9.4	8.7	23.1	3.3	44.5	99	94	135
W-15	30	31	580	235533	9.9	11.6	22.0	3.0	46.5	121	99	144
TOTAL		2598		10627513	10.0	11.0	19.0	2.9	42.9	4690	5165	6495
TARGETS (P.V.INJECTED):					10.0	11.0	19.0	32.0				

BBLS.OF 625 PPM POLYMER REMAINING TO BE INJECTED: 3088831.0
DAYS REMAINING TO COMPLETE 625 PPM POLYMER INJECTION: 475.6

* DENOTES PROBLEM WELL.

2.5-ACRE INJECTION DATA SUMMARY

FLUID TYPE	PV	PROJECTED INJECTION HISTORY START	FINISH	INJECTION RATE DEVIATION REC RATE BASIS	THIS REPORT	LAST REPORT
SLUG	10	2/10/77	11/20/78	NO. WELLS WITHIN 5 % OF REC. RATE:	1	3
1156	11	11/20/78	5/20/79	NO. WELLS WITHIN 20 % OF REC. RATE:	16	23
800	19	5/20/79	7/28/80	NO. WELLS WITHIN 50 % OF REC. RATE:	71	64
625	32	7/28/80	5/14/82			

AVERAGE VISCOSITY :	19.2
AVERAGE SCREEN FACTOR :	19.7
TOTAL POLYMER INJECTED (LBS.) :	33887
TOTAL POLYMER CONCENTRATION (PPM):	625

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE INJECTION REPORT
SEPTEMBER 1980 (30 DAYS)

WELL		DAYS ACTIVE	(FT) NET SAND	PRESS	(BBLS) PURE VOL	****PERCENT INJECTED**** PV SLUG	PV 1156	PV 800	PV TOTAL	PREV MON. RATE	(B/D) CURRENT RATE	REC RATE (B/D)
CC-11		30	32	300	179070	9.9	11.2	6.2	27.3	40	42	66
CC-13		30	36	460	330722	10.1	12.0	5.8	27.9	61	94	111
CC-15		30	10	420	166984	10.0	11.2	6.7	27.8	59	59	57
CC-17		30	21	580	232323	9.9	11.9	6.3	28.1	48	55	75
EE-11		30	24	420	186979	9.9	12.6	8.3	30.8	53	57	34
EE-13		30	45	480	335370	10.0	11.5	4.6	26.2	100	72	145
EE-15		30	42	500	313883	9.9	11.3	5.9	27.1	33	112	119
EE-17		30	22	480	149259	10.1	10.7	9.1	29.8	64	67	34
GG-13		30	33	580	290091	10.1	10.8	5.3	26.2	32	110	125
GG-15		30	39	480	310349	10.1	11.3	5.2	26.5	88	103	127
GG-17		30	25	320	196177	10.2	12.4	6.5	29.1	64	55	53
GG-19		30	35	500	271277	10.2	11.8	7.2	29.2	80	86	72
II-13	*	30	24	670	208574	10.1	11.6	5.7	27.5	40	37	47
II-15		30	20	580	203893	9.9	14.9	5.3	27.1	30	51	76
II-17		30	13	580	130776	10.0	14.8	8.1	32.9	71	63	7
KK-13		30	13	580	149698	10.2	11.9	9.6	31.7	42	38	18
KK-15		30	23	580	162784	10.0	10.7	6.5	27.2	36	40	60
MM-13		30	20	670	175026	10.3	9.4	7.7	27.4	42	45	63
MM-15	*	30	19	670	121753	10.1	8.1	6.1	24.4	30	36	46
OO-13		30	29	670	254995	10.0	11.6	5.9	27.5	45	56	91
OO-15		30	28	670	185573	10.0	11.5	7.2	28.7	37	47	54
QQ-13		30	32	580	249117	10.2	11.0	6.2	27.4	48	73	89
QQ-15		30	28	600	153960	10.2	11.0	5.8	27.0	35	42	59
SS-1	*	25	18	670	162464	8.3	5.3	1.1	14.8	5	6	16
SS-3	*	27	21	670	170972	9.9	8.3	4.6	22.8	27	30	40
SS-5		30	15	580	122640	10.3	10.4	7.2	27.8	53	63	41
SS-7		30	15	480	115206	10.0	9.9	6.0	25.9	42	42	51
SS-9	*	30	38	670	263508	9.9	9.6	4.3	24.0	29	28	38
SS-11	*	23	25	0	203122	10.0	9.4	5.3	24.8	39	39	49
TOTAL			745		5996535	10.0	11.0	6.0	27.0	1373	1648	1863

TARGETS (P.V.INJECTED): 10.0 11.0 19.0
BBLS.OF 800 PPM POLYMER REMAINING TO BE INJECTED: 777328.0
DAYS REMAINING TO COMPLETE 800 PPM POLYMER INJECTION: 417.2

* DENOTES PROBLEM WELL.

5.0-ACRE INJECTION DATA SUMMARY

FLUID TYPE	PV	PROJECTED INJECTION HISTORY START	FINISH	INJECTION RATE DEVIATION REC RATE BASIS	THIS REPORT	LAST REPORT
SLUG	10	2/10/77	11/20/78	NO. WELLS WITHIN 5 % OF REC. RATE:	2	1
1156	11	11/20/78	1/14/80	NO. WELLS WITHIN 20 % OF REC. RATE:	10	5
800	19	1/15/80	3/ 1/82	NO. WELLS WITHIN 50 % OF REC. RATE:	22	21

AVERAGE VISCOSITY	: 27.9
AVERAGE SCREEN FACTOR	: 21.5
TOTAL POLYMER INJECTED (LBS.)	: 13853
TOTAL POLYMER CONCENTRATION (PPM)	: 800

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
PERIPHERAL INJECTION WELL REPORT
SEPTEMBER 1980 (30 DAYS)

WELL	DAYS ACTIVE	(FT) NET SAND	PRESS	CUM.# PROJECT INJ.	PREV. RATE (B/D)	CURRENT RATE (B/D)	RECD RATE (B/D)
UU-1 *	26	11	520	15327	0	0	36
UU-5 *	30	10	500	28696	0	69	91
X-88 *	30	19	640	11920	27	36	8
X-91 **	--	30	--	97	--	--	--
X-94 **	--	23	--	11498	--	--	--
X-97 **	--	27	--	8596	--	--	--
X-3 **	--	29	--	12202	--	--	--
X-6	30	26	540	15374	0	24	61
X-9 **	--	9	--	17020	--	--	--
X-12 **	--	32	--	3868	--	--	--
A-12 **	--	51	--	48185	--	--	--
P-12 *	30	13	140	62417	7	314	109
W-12 *	30	9	300	69303	64	69	75
R-12 *	30	26	380	25316	51	47	75
CF-6	26	40	60	29287	185	232	33
PI-1	30	17	80	1460	21	5	16
PI-3	30	25	60	1739	22	8	16
PI-4	30	32	30	1497	29	4	18
PI-6	30	26	0	838	13	5	18
PERIPHERAL TOTALS	455			363640	419	813	556
5.0-ACRE TOTALS				171450	142	221	285
2.5-ACRE TOTALS				192190	277	592	271

* INDICATES 5.0-ACRE WELLS

** INDICATES WELLS PLUGGED AND ABANDONED

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE FIVE SPOT REPORT
SEPTEMBER 1980 (30 DAYS)

WELL	DAYS ACTIVE	OIL PROD CUM OIL DAILY AVE	WATER PROD CUM WATER DAILY AVE	FLUID PROD CUM FLUID DAILY AVE	FLD(PV) CUM FLD(PV)	INJECTION CUM INJ DAILY AVE	PORE VOL	OIL CUT	CUM OIL/ PORE VOL	CUM INJ/ PORE VOL	FLD/INJ CUM FLD/ CUM INJ
XA-10	30	30.8 688.8 1.0	0.0 20.6 0.0	30.8 709.3 1.0	0.001 0.031	268.3 11118.2 8.9	23252	1.000	0.030	0.478	0.11 0.06
XA-12	30	207.3 10923.4 6.9	795.4 21624.7 26.5	1002.7 32548.1 33.4	0.017 0.565	723.9 24878.6 24.1	57623	0.207	0.190	0.432	1.38 1.31
XA-14	30	106.4 3844.7 3.5	333.5 21264.7 11.1	440.0 25109.4 14.7	0.006 0.350	865.6 30604.8 28.9	71828	0.242	0.054	0.426	0.51 0.82
AA-11	30	294.1 7627.9 9.8	1270.1 45334.7 42.3	1564.2 52962.6 52.1	0.050 1.684	410.0 16664.1 13.7	31456	0.188	0.242	0.530	3.82 3.18
B-0	30	53.2 1594.1 1.8	649.1 88720.6 21.6	702.4 90314.6 23.4	0.011 1.427	1837.5 64831.2 61.2	63309	0.076	0.025	1.024	0.38 1.39
EB-5	30	14.0 1766.2 0.5	931.4 56265.1 31.0	945.4 58031.3 31.5	0.011 0.704	801.8 51108.6 26.7	82486	0.015	0.021	0.620	1.18 1.14
B-4	30	19.6 878.8 0.7	82.1 9092.9 2.7	101.7 9971.7 3.4	0.004 0.396	266.6 11143.1 8.9	25188	0.193	0.035	0.442	0.38 0.89
B-6	30	11.2 448.5 0.4	41.1 2364.7 1.4	52.3 2813.1 1.7	0.002 0.102	144.0 6980.0 4.8	27488	0.214	0.016	0.254	0.36 0.40
B-8	30	16.8 1416.6 0.6	59.0 4720.1 2.0	75.8 6136.6 2.5	0.002 0.199	85.2 5590.5 2.8	30786	0.222	0.046	0.182	0.89 1.10
B-10	30	114.8 369.5 3.8	23.1 379.7 0.8	137.9 749.3 4.6	0.006 0.032	326.9 14251.1 10.9	23297	0.833	0.016	0.612	0.42 0.05

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE FIVE SPOT REPORT
SEPTEMBER 1980 (30 DAYS)

WELL	DAYS ACTIVE	OIL PROD CUM OIL DAILY AVE	WATER PROD CUM WATER DAILY AVE	FLUID PROD CUM FLUID DAILY AVE	FLD(PV) CUM FLD(PV)	INJECTION CUM INJ DAILY AVE	PORE VOL	OIL CUT	CUM OIL/ PORE VOL	CUM INJ/ PORE VOL	FLD/INJ CUM FLD/ CUM INJ
B-12	30	170.9 13232.9 5.7	556.8 33189.8 18.6	727.6 46422.7 24.3	0.008 0.483	1192.0 41492.3 39.7	96079	0.235	0.138	0.432	0.61 1.12
B-14	30	123.2 1891.7 4.1	944.2 35355.9 31.5	1067.4 37247.6 35.6	0.008 0.269	1333.7 56154.7 44.5	138324	0.115	0.014	0.406	0.80 0.66
B-16	25	44.4 1495.1 1.5	395.6 44404.1 13.2	439.9 45899.2 14.7	0.003 0.322	1425.0 51955.0 47.5	142341	0.101	0.011	0.365	0.31 0.88
D-0	30	30.8 811.0 1.0	526.0 31550.2 17.5	556.8 32361.2 18.6	0.011 0.642	1440.2 41609.1 48.0	50426	0.055	0.016	0.825	0.39 0.78
D-2	30	103.6 2216.4 3.5	248.9 21054.6 8.3	352.5 23271.0 11.8	0.004 0.258	1058.5 36991.7 35.3	90143	0.294	0.025	0.410	0.33 0.63
D-4	24	42.6 5159.1 1.4	420.8 20512.1 14.0	463.4 25671.2 15.4	0.010 0.536	528.7 23056.0 17.6	47861	0.092	0.108	0.482	0.88 1.11
D-6	30	154.1 4355.0 5.1	1144.3 41249.0 38.1	1298.4 45604.0 43.3	0.014 0.477	541.7 25465.1 18.1	95658	0.119	0.046	0.266	2.40 1.79
D-8	30	47.6 748.2 1.6	202.7 11373.8 6.8	250.3 12122.1 8.3	0.003 0.152	408.7 21500.3 13.6	79988	0.190	0.009	0.269	0.61 0.56
D-10	30	56.0 1421.5 1.9	236.1 13569.0 7.9	292.1 14990.4 9.7	0.008 0.407	123.5 8751.2 4.1	36821	0.192	0.039	0.238	2.37 1.71
F-0	30	50.4 3541.8 1.7	292.5 23317.0 9.7	342.9 26858.8 11.4	0.009 0.678	492.3 19027.1 16.4	39598	0.147	0.089	0.481	0.70 1.41

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE FIVE SPOT REPORT
SEPTEMBER 1980 (30 DAYS)

WELL	DAYS ACTIVE	OIL PROD CUM OIL DAILY AVE	WATER PROD CUM WATER DAILY AVE	FLUID PROD CUM FLUID DAILY AVE	FLD(PV) CUM FLD(PV)	INJECTION CUM INJ DAILY AVE	PORE VOL	OIL CUT	CUM OIL/ PORE VOL	CUM INJ/ PORE VOL	FLD/INJ CUM FLD/ CUM INJ
F-2	30	201.7 3992.8 6.7	451.6 12188.7 15.1	653.3 16181.4 21.8	0.011 0.277	571.3 23651.5 19.0	58501	0.309	0.068	0.404	1.14 0.68
F-4	22	6.2 248.8 0.2	20.7 3635.6 0.7	26.9 3884.4 0.9	0.001 0.088	696.9 30096.1 23.2	43996	0.229	0.006	0.684	0.04 0.13
F-6	30	84.0 2129.1 2.8	1436.8 69326.4 47.9	1520.9 71455.5 50.7	0.015 0.709	1186.9 40864.5 39.6	100749	0.055	0.021	0.406	1.28 1.75
F-8	30	19.6 249.6 0.7	551.6 14916.9 18.4	571.2 15166.5 19.0	0.007 0.175	925.7 34393.4 30.9	86889	0.034	0.003	0.396	0.62 0.44
F-10	30	14.0 596.2 0.5	141.1 8745.1 4.7	155.1 9343.3 5.2	0.003 0.182	350.9 19601.4 11.7	51403	0.090	0.012	0.381	0.44 0.48
F-12	30	11.2 263.8 0.4	174.5 9027.0 5.8	185.7 9290.8 6.2	0.006 0.287	385.5 12778.2 12.9	32366	0.060	0.008	0.395	0.48 0.73
F-14	30	33.6 1038.9 1.1	118.0 7146.0 3.9	151.6 8184.9 5.1	0.004 0.203	895.4 28050.1 29.8	40285	0.222	0.026	0.696	0.17 0.29
H-0	30	207.3 11569.7 6.9	1323.9 65377.3 44.1	1531.2 76947.0 51.0	0.040 2.004	479.9 21344.8 16.0	38404	0.135	0.301	0.556	3.19 3.60
H-2	22	34.9 1981.8 1.2	92.2 7982.2 3.1	127.1 9964.0 4.2	0.002 0.131	752.1 29648.6 25.1	76083	0.275	0.026	0.390	0.17 0.34
H-4	30	246.5 4464.9 8.2	1095.6 46410.7 36.5	1342.1 50875.6 44.7	0.014 0.541	1003.3 38759.8 33.4	94033	0.184	0.047	0.412	1.34 1.31

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE FIVE SPOT REPORT
SEPTEMBER 1980 (30 DAYS)

WELL	DAYS ACTIVE	OIL PROD CUM OIL DAILY AVE	WATER PROD CUM WATER DAILY AVE	FLUID PROD CUM FLUID DAILY AVE	FLD(PV) CUM FLD(PV)	INJECTION CUM INJ DAILY AVE	PORE VOL	OIL CUT	CUM OIL/ PORE VOL	CUM INJ/ PORE VOL	FLD/INJ CUM FLD/ CUM INJ
H-6	30	42.0 882.9 1.4	1362.4 40617.2 45.4	1404.4 41500.1 46.8	0.013 0.377	1317.1 43859.3 43.9	109986	0.030	0.008	0.399	1.07 0.95
H-8	23	38.7 1166.0 1.3	326.5 41438.2 10.9	365.2 42604.2 12.2	0.004 0.444	1069.1 37700.4 35.6	95901	0.106	0.012	0.393	0.34 1.13
H-10	30	70.0 1855.7 2.3	567.0 29485.3 18.9	637.1 31341.1 21.2	0.008 0.409	858.2 34328.3 28.6	76555	0.110	0.024	0.448	0.74 0.91
H-12	30	165.3 2885.3 5.5	1211.0 34376.2 40.4	1376.3 37261.5 45.9	0.024 0.643	895.4 30210.2 29.8	57907	0.120	0.050	0.522	1.54 1.23
H-14	30	165.3 6877.1 5.5	1891.0 55892.4 63.0	2056.2 62769.5 68.5	0.023 0.697	1343.6 50513.6 44.8	90003	0.080	0.076	0.561	1.53 1.24
J-0	24	26.9 1085.1 0.9	139.6 14623.6 4.7	166.5 15708.6 5.5	0.004 0.378	630.6 25361.8 21.0	41558	0.162	0.026	0.610	0.26 0.62
J-2	30	207.3 3996.8 6.9	831.3 31199.3 27.7	1038.6 35196.1 34.6	0.013 0.433	1020.2 40469.7 34.0	81310	0.200	0.049	0.498	1.02 0.87
J-4	30	19.6 2669.0 0.7	1985.9 56029.0 66.2	2005.5 58698.0 66.9	0.016 0.463	2525.4 45956.5 84.2	126673	0.010	0.021	0.363	0.79 1.28
J-6	30	330.5 1950.1 11.0	2003.9 41024.8 66.8	2334.4 42974.9 77.8	0.018 0.337	2576.4 49778.7 85.9	127371	0.142	0.015	0.391	0.91 0.86
J-8	30	165.3 5139.6 5.5	1134.1 49130.7 37.8	1299.3 54270.2 43.3	0.010 0.436	1118.4 43527.9 37.3	124459	0.127	0.041	0.350	1.16 1.25

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE FIVE SPOT REPORT
SEPTEMBER 1980 (30 DAYS)

WELL	DAYS ACTIVE	OIL PROD CUM OIL DAILY AVE	WATER PROD CUM WATER DAILY AVE	FLUID PROD CUM FLUID DAILY AVE	FLD(PV) CUM FLD(PV)	INJECTION CUM INJ DAILY AVE	PORE VOL	OIL CUT	CUM OIL/ PORE VOL	CUM INJ/ PORE VOL	FLD/INJ CUM FLD/ CUM INJ
J-10	30	33.6 1444.1 1.1	585.0 14557.4 19.5	618.6 16001.5 20.6	0.006 0.158	1246.8 40061.5 41.6	101349	0.054	0.014	0.395	0.50 0.40
J-12	30	14.0 604.4 0.5	969.9 26597.7 32.3	983.9 27202.1 32.8	0.010 0.276	1354.7 41163.8 45.2	98442	0.014	0.006	0.418	0.73 0.66
J-14	30	42.0 1654.2 1.4	1852.5 91721.2 61.7	1894.5 93375.4 63.1	0.014 0.698	2325.6 80548.7 77.5	133805	0.022	0.012	0.602	0.81 1.16
L-0	27	12.6 1605.5 0.4	346.4 30716.2 11.5	359.0 32321.7 12.0	0.006 0.567	732.5 33673.2 24.4	57036	0.035	0.028	0.590	0.49 0.96
L-2	30	123.2 1751.0 4.1	869.8 23803.5 29.0	993.0 25554.5 33.1	0.013 0.331	1337.6 49131.0 44.6	77129	0.124	0.023	0.637	0.74 0.52
L-4	24	62.7 834.8 2.1	353.0 30869.7 11.8	415.8 31704.4 13.9	0.003 0.237	3110.5 56765.4 103.7	133876	0.151	0.006	0.424	0.13 0.56
L-6	30	453.8 6865.0 15.1	2460.6 47677.3 82.0	2914.3 54542.3 97.1	0.021 0.390	3381.0 67434.7 112.7	139935	0.156	0.049	0.482	0.86 0.81
L-8	26	133.3 3387.8 4.4	433.4 29420.2 14.4	566.8 32808.0 18.9	0.004 0.229	1832.1 66809.1 61.1	143466	0.235	0.024	0.466	0.31 0.49
L-10	30	246.5 2542.5 8.2	2563.2 47557.5 85.4	2809.7 50100.0 93.7	0.027 0.477	2292.5 62352.6 76.4	105002	0.088	0.024	0.594	1.23 0.80
L-12	30	285.5 10246.8 9.6	1249.5 64242.7 41.7	1538.0 74489.5 51.3	0.011 0.528	2612.1 68191.4 87.1	141141	0.188	0.073	0.483	0.59 1.09

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE FIVE SPOT REPORT
SEPTEMBER 1980 (30 DAYS)

WELL	DAYS ACTIVE	OIL PROD CUM OIL DAILY AVE	WATER PROD CUM WATER DAILY AVE	FLUID PROD CUM FLUID DAILY AVE	FLD(PV) CUM FLD(PV)	INJECTION CUM INJ DAILY AVE	PORE VOL	OIL CUT	CUM OIL/ PORE VOL	CUM INJ/ PORE VOL	FLD/INJ CUM FLD/ CUM INJ
L-14	30	123.2 3094.3 4.1	1929.5 68427.0 64.3	2052.7 71521.2 68.4	0.015 0.538	2771.6 75708.1 92.4	132995	0.060	0.023	0.569	0.74 0.94
N-0	30	16.8 1311.1 0.6	523.4 37919.1 17.4	540.2 39230.2 18.0	0.007 0.513	685.7 26886.5 22.9	76442	0.031	0.017	0.352	0.79 1.46
N-2	30	123.2 4347.5 4.1	1778.1 84876.0 59.3	1901.3 89223.5 63.4	0.019 0.913	974.1 42459.3 32.5	97694	0.065	0.045	0.435	1.95 2.10
N-4	30	907.6 19669.8 30.3	3733.2 90486.7 124.4	4640.7 110156.5 154.7	0.033 0.795	1735.1 55274.6 57.8	138627	0.196	0.142	0.399	2.67 1.99
N-6	30	619.0 12394.8 20.6	2606.8 97100.1 86.9	3225.9 109494.8 107.5	0.019 0.644	2491.0 78252.1 83.0	169978	0.192	0.073	0.460	1.30 1.40
N-8	30	207.3 8695.1 6.9	2155.2 98393.8 71.8	2362.5 107088.9 78.6	0.013 0.571	2875.0 86118.9 95.8	187415	0.088	0.046	0.460	0.82 1.24
N-10	30	372.5 6057.5 12.4	2155.2 98457.0 71.8	2527.8 104514.4 84.3	0.014 0.594	4586.7 89958.5 152.9	175851	0.147	0.034	0.512	0.55 1.16
N-12	30	165.3 759.4 5.5	3705.0 92363.4 123.5	3870.2 93122.8 129.0	0.019 0.455	4977.0 91052.6 165.9	204686	0.043	0.004	0.445	0.78 1.02
N-14	30	207.3 1864.1 6.9	3440.7 101193.2 114.7	3648.0 103057.4 121.6	0.016 0.448	4421.0 106194.4 147.4	229987	0.057	0.008	0.462	0.83 0.97
P-0	30	19.6 1599.0 0.7	813.3 26653.0 27.1	833.0 28252.0 27.8	0.018 0.610	592.6 27902.9 19.8	46305	0.024	0.035	0.603	1.41 1.01

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE FIVE SPOT REPORT
SEPTEMBER 1980 (30 DAYS)

WELL	DAYS ACTIVE	OIL PROD CUM OIL DAILY AVE	WATER PROD CUM WATER DAILY AVE	FLUID PROD CUM FLUID DAILY AVE	FLD(PV) CUM FLD(PV)	INJECTION CUM INJ DAILY AVE	PORE VOL	OIL CUT	CUM OIL/ PORE VOL	CUM INJ/ PORE VOL	FLD/INJ CUM FLD/ CUM INJ
P-2	30	165.3 2509.6 5.5	1098.1 40968.7 36.6	1263.4 43478.4 42.1	0.014 0.468	1079.0 39188.8 36.0	92938	0.131	0.027	0.422	1.17 1.11
P-4	30	140.1 2191.2 4.7	338.7 20484.4 11.3	478.7 22675.7 16.0	0.005 0.225	1159.4 39625.1 38.6	100901	0.293	0.022	0.393	0.41 0.57
P-6	30	11.2 398.1 0.4	1916.6 51386.1 63.9	1927.8 51784.2 64.3	0.012 0.310	1631.7 63336.4 54.4	167022	0.006	0.002	0.379	1.18 0.82
P-8	30	19.6 227.4 0.7	3086.6 57272.3 102.9	3106.2 57499.7 103.5	0.019 0.346	3024.0 79091.1 100.8	166037	0.006	0.001	0.476	1.03 0.73
P-10	30	165.3 2141.8 5.5	2645.3 56644.6 88.2	2810.6 58786.4 93.7	0.015 0.311	4447.9 87669.4 148.3	188735	0.059	0.011	0.465	0.63 0.67
P-12	27	148.7 1467.1 5.0	1565.6 53590.7 52.2	1714.4 55057.8 57.1	0.011 0.349	4200.8 85706.9 140.0	157985	0.087	0.009	0.543	0.41 0.64
P-14	30	42.0 1440.4 1.4	4800.5 118110.6 160.0	4842.6 119551.0 161.4	0.024 0.597	3736.1 98376.6 124.5	200173	0.009	0.007	0.491	1.30 1.22
R-0	30	14.0 1046.1 0.5	2937.8 36587.6 97.9	2951.8 37633.6 98.4	0.059 0.754	901.3 32618.0 30.0	49932	0.005	0.021	0.653	3.28 1.15
R-2	28	62.7 623.4 2.1	306.5 20580.9 10.2	369.3 21204.3 12.3	0.004 0.227	1647.9 39548.7 54.9	93453	0.170	0.007	0.423	0.22 0.54
R-4	30	266.1 1888.6 8.9	284.8 14746.0 9.5	550.9 16634.5 18.4	0.010 0.296	1140.8 29031.9 38.0	56261	0.483	0.034	0.516	0.48 0.57

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE FIVE SPOT REPORT
SEPTEMBER 1980 (30 DAYS)

WELL	DAYS ACTIVE	OIL PROD CUM OIL DAILY AVE	WATER PROD CUM WATER DAILY AVE	FLUID PROD CUM FLUID DAILY AVE	FLD(PV) CUM FLD(PV)	INJECTION CUM INJ DAILY AVE	PORE VOL	OIL CUT	CUM OIL/ PORE VOL	CUM INJ/ PORE VOL	FLD/INJ CUM FLD/ CUM INJ
R-6	30	134.5 4493.2 4.5	862.1 38480.9 28.7	996.5 42974.1 33.2	0.010 0.431	1040.7 44190.7 34.7	99678	0.135	0.045	0.443	0.96 0.97
R-8	30	577.0 8817.3 19.2	2950.6 85862.9 98.4	3527.7 94680.2 117.6	0.022 0.600	2198.0 69391.0 73.3	157827	0.164	0.056	0.440	1.60 1.36
R-10	30	249.3 3591.6 8.3	3930.8 75477.9 131.0	4180.0 79069.4 139.3	0.026 0.494	2647.1 79809.5 88.2	160116	0.060	0.022	0.498	1.58 0.99
R-12	30	246.5 6893.6 8.2	2306.6 63267.3 76.9	2553.1 70160.9 85.1	0.016 0.432	2152.8 74202.4 71.8	162359	0.097	0.042	0.457	1.19 0.95
R-14	30	453.8 13187.9 15.1	2383.6 82870.9 79.5	2837.4 96058.7 94.6	0.017 0.583	2974.4 94338.7 99.1	164729	0.160	0.080	0.573	0.95 1.02
T-0	30	47.6 614.8 1.6	125.7 25870.0 4.2	173.3 26484.8 5.8	0.004 0.670	790.9 26460.3 26.4	39555	0.275	0.016	0.669	0.22 1.00
T-2	30	22.4 257.0 0.7	12.8 24485.6 0.4	35.2 24742.6 1.2	0.000 0.335	1210.7 33886.9 40.4	73817	0.636	0.003	0.459	0.03 0.73
T-4	30	67.2 819.7 2.2	382.3 15882.8 12.7	449.5 16702.4 15.0	0.008 0.280	1137.2 27023.5 37.9	59636	0.150	0.014	0.453	0.40 0.62
T-6	30	207.3 4454.3 6.9	1172.6 24875.2 39.1	1379.8 29329.5 46.0	0.018 0.391	1482.7 36573.8 49.4	74961	0.150	0.059	0.488	0.93 0.80
T-8	25	119.0 2394.6 4.0	622.2 42055.9 20.7	741.2 44450.4 24.7	0.005 0.316	1856.6 56585.6 61.9	140819	0.161	0.017	0.402	0.40 0.79

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE FIVE SPOT REPORT
SEPTEMBER 1980 (30 DAYS)

WELL	DAYS ACTIVE	OIL PROD CUM OIL DAILY AVE	WATER PROD CUM WATER DAILY AVE	FLUID PROD CUM FLUID DAILY AVE	FLD(PV) CUM FLD(PV)	INJECTION CUM INJ DAILY AVE	PORE VOL	OIL CUT	CUM OIL/ PORE VOL	CUM INJ/ PORE VOL	FLD/INJ CUM FLD/ CUM INJ
T-10	30	392.2 4307.2 13.1	1873.0 76439.6 62.4	2265.2 80746.8 75.5	0.014 0.502	2167.3 71407.1 72.2	160801	0.173	0.027	0.444	1.05 1.13
T-12	30	84.0 599.4 2.8	1814.0 87579.2 60.5	1898.0 88178.6 63.3	0.014 0.635	2212.3 71027.4 73.7	138801	0.044	0.004	0.512	0.86 1.24
T-14	30	42.0 1075.8 1.4	415.7 34221.8 13.9	457.7 35297.6 15.3	0.003 0.193	2240.0 78299.9 74.7	182561	0.092	0.006	0.429	0.20 0.45
V-0	30	19.6 197.6 0.7	310.5 33938.5 10.3	330.1 34136.0 11.0	0.005 0.498	850.0 26412.9 28.3	68550	0.059	0.003	0.385	0.39 1.29
V-2	30	246.5 3018.3 8.2	3327.8 48977.7 110.9	3574.3 51996.0 119.1	0.040 0.579	1087.0 38183.1 36.2	89783	0.069	0.034	0.425	3.29 1.36
V-4	30	47.6 879.9 1.6	264.3 19393.5 8.8	311.9 20273.4 10.4	0.005 0.309	960.5 26600.9 32.0	65527	0.153	0.013	0.406	0.32 0.76
V-6	30	414.6 13632.0 13.8	1814.0 56811.9 60.5	2228.6 70443.9 74.3	0.039 1.231	1391.7 33823.4 46.4	57221	0.186	0.238	0.591	1.60 2.08
V-8	30	78.4 411.9 2.6	118.0 13813.6 3.9	196.5 14225.5 6.5	0.002 0.175	1578.7 43033.2 52.6	81115	0.399	0.005	0.531	0.12 0.33
V-10	30	288.5 5447.0 9.6	1326.5 69003.9 44.2	1615.0 74450.9 53.8	0.013 0.601	2224.0 62382.2 74.1	123793	0.179	0.044	0.504	0.73 1.19
V-12	30	495.8 8709.6 16.5	2078.3 83552.9 69.3	2574.1 92262.6 85.8	0.018 0.635	2680.0 76318.9 89.3	145395	0.193	0.060	0.525	0.96 1.21

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE FIVE SPOT REPORT
SEPTEMBER 1980 (30 DAYS)

WELL	DAYS ACTIVE	OIL PROD CUM OIL DAILY AVE	WATER PROD CUM WATER DAILY AVE	FLUID PROD CUM FLUID DAILY AVE	FLD(PV) CUM FLD(PV)	INJECTION CUM INJ DAILY AVE	PORE VOL	OIL CUT	CUM OIL/ PORE VOL	CUM INJ/ PORE VOL	FLD/INJ CUM FLD/ CUM INJ
V-14	27	335.3 6994.7 11.2	1598.0 80312.8 53.3	1933.2 87307.6 64.4	0.013 0.597	2439.1 91689.7 81.3	146174	0.173	0.048	0.627	0.79 0.95
TOTAL		13558.0 314936.0 451.9	109203.9 3920515.5 3640.2	122761.7 4235450.7 4092.1	0.014 0.467	141501.4 4245841.2 4716.7	9066200	0.074	0.035	0.468	0.87 1.00

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE FIVE SPOT REPORT
SEPTEMBER 1980 (30 DAYS)

WELL	DAYS ACTIVE	OIL PROD CUM OIL DAILY AVE	WATER PROD CUM WATER DAILY AVE	FLUID PROD CUM FLUID DAILY AVE	FLD(PV) CUM FLD(PV)	INJECTION CUM INJ DAILY AVE	PORE VOL	OIL CUT	CUM OIL/ PORE VOL	CUM INJ/ PORE VOL	FLD/INJ CUM FLD/ CUM INJ
AS-35	30	131.6 3755.5 4.4	1553.4 37671.7 51.8	1685.0 41427.2 56.2	0.023 0.568	3506.1 63252.2 116.9	72916	0.078	0.052	0.867	0.48 0.65
AS-36	0	0.0 1422.4 0.0	0.0 188999.6 0.0	0.0 190421.9 0.0	0.0 1.543	3734.7 88863.6 124.5	123442	0.0	0.012	0.720	0.0 2.14
DD-10	30	131.6 3201.2 4.4	790.9 27753.5 26.4	922.5 30954.7 30.7	0.011 0.358	916.5 33545.8 30.5	86394	0.143	0.037	0.388	1.01 0.92
DD-12	30	26.7 568.5 0.9	3018.6 79531.4 100.6	3045.3 80099.9 101.5	0.009 0.235	1896.7 69921.7 63.2	340851	0.009	0.002	0.205	1.61 1.15
DD-14	30	209.6 5352.4 7.0	2014.3 114621.4 67.1	2224.1 119973.7 74.1	0.008 0.406	2521.5 77835.5 84.1	295683	0.094	0.018	0.263	0.88 1.54
DD-16	30	26.7 1403.9 0.9	810.8 60912.5 27.0	837.5 62316.4 27.9	0.004 0.266	2196.9 60981.0 73.2	234062	0.032	0.006	0.261	0.38 1.02
DD-18	30	76.4 1237.6 2.5	697.0 40882.6 23.2	773.5 42120.1 25.8	0.008 0.424	1739.7 32781.9 58.0	99411	0.099	0.012	0.330	0.44 1.28
FF-12	30	53.3 687.3 1.8	1971.6 94066.9 65.7	2025.0 94754.2 67.5	0.007 0.323	2226.4 72362.2 74.2	292955	0.026	0.002	0.247	0.91 1.31
FF-14	30	174.2 2446.8 5.8	2990.2 98506.3 99.7	3164.4 100953.1 105.5	0.009 0.291	2976.2 82702.1 99.2	347235	0.055	0.007	0.238	1.06 1.22
FF-16	30	53.3 2691.9 1.8	1843.6 93452.9 61.5	1896.9 96144.7 63.2	0.008 0.412	2527.2 67416.8 84.2	233092	0.028	0.012	0.289	0.75 1.43

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE FIVE SPOT REPORT
SEPTEMBER 1980 (30 DAYS)

WELL	DAYS ACTIVE	OIL PROD CUM OIL DAILY AVE	WATER PROD CUM WATER DAILY AVE	FLUID PROD CUM FLUID DAILY AVE	FLD(PV) CUM FLD(PV)	INJECTION CUM INJ DAILY AVE	PORE VOL	OIL CUT	CUM OIL/ PORE VOL	CUM INJ/ PORE VOL	FLD/INJ CUM FLD/ CUM INJ
FF-18	30	209.8 7053.6 7.0	2096.8 64041.4 69.9	2306.6 71094.9 76.9	0.014 0.432	1561.9 45334.2 52.1	164544	0.091	0.043	0.276	1.48 1.57
FF-20	30	3.6 2191.4 0.1	45.5 1809.9 1.5	49.1 4001.3 1.6	0.001 0.070	648.1 19771.1 21.6	57048	0.072	0.038	0.347	0.08 0.20
HH-12	24	42.7 1510.6 1.4	2783.6 78450.2 92.8	2826.3 79960.7 94.2	0.010 0.294	2443.7 77804.7 81.5	272292	0.015	0.006	0.286	1.16 1.03
HH-14	30	12.4 548.8 0.4	1909.0 91207.1 63.6	1921.5 91755.9 64.0	0.007 0.327	2265.4 67570.4 75.5	280397	0.006	0.002	0.241	0.85 1.36
HH-16	30	176.0 5623.1 5.9	708.4 45068.1 23.6	884.4 50691.1 29.5	0.004 0.227	2195.8 62787.0 73.2	222864	0.199	0.025	0.282	0.40 0.81
HH-18	30	131.6 876.5 4.4	2389.9 74157.6 79.7	2521.4 75034.1 84.0	0.014 0.410	1684.0 48570.7 56.1	183019	0.052	0.005	0.265	1.50 1.54
HH-20	30	17.8 2971.0 0.6	79.7 2789.7 2.7	97.4 5760.7 3.2	0.001 0.085	648.1 19771.1 21.6	67865	0.182	0.044	0.291	0.15 0.29
JJ-12	29	101.4 3129.0 3.4	2189.2 93862.7 73.0	2290.6 96991.7 76.4	0.008 0.332	3111.5 90816.3 103.7	292199	0.044	0.011	0.311	0.74 1.07
JJ-14	30	30.2 966.9 1.0	441.0 25948.8 14.7	471.2 26915.7 15.7	0.003 0.182	1347.6 54735.9 44.9	147711	0.064	0.007	0.371	0.35 0.49
JJ-16	30	209.8 7488.5 7.0	1382.7 58599.1 46.1	1592.5 66087.6 53.1	0.010 0.397	1423.1 43383.0 47.4	166634	0.132	0.045	0.260	1.12 1.52

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE FIVE SPOT REPORT
SEPTEMBER 1980 (30 DAYS)

WELL	DAYS ACTIVE	OIL PROD CUM OIL DAILY AVE	WATER PROD CUM WATER DAILY AVE	FLUID PROD CUM FLUID DAILY AVE	FLD(PV) CUM FLD(PV)	INJECTION CUM INJ DAILY AVE	PORE VOL	OIL CUT	CUM OIL/ PORE VOL	CUM INJ/ PORE VOL	FLD/INJ CUM FLD/ CUM INJ
LL-12	30	78.2 1277.5 2.6	4068.4 79025.9 135.6	4146.7 80303.4 138.2	0.013 0.245	2948.1 93914.2 98.3	327428	0.019	0.004	0.287	1.41 0.86
LL-14	30	23.1 775.7 0.8	543.4 24320.2 18.1	566.5 25095.9 18.9	0.004 0.164	1573.4 53836.7 52.4	152809	0.041	0.005	0.352	0.36 0.47
NN-12	30	78.2 5447.2 2.6	3479.5 115938.1 116.0	3557.7 121385.3 118.6	0.015 0.501	2073.0 76017.5 69.1	242122	0.022	0.022	0.314	1.72 1.60
NN-14	30	26.7 1272.7 0.9	1382.7 42834.4 46.1	1409.4 44107.1 47.0	0.005 0.164	1793.6 53090.5 59.8	268441	0.019	0.005	0.198	0.79 0.83
PP-12	24	209.1 7627.3 7.0	2417.2 85878.0 80.6	2626.2 93505.2 87.5	0.012 0.440	2313.3 99890.9 77.1	212400	0.080	0.036	0.470	1.14 0.94
PP-14	29	25.8 1985.1 0.9	1540.1 91345.7 51.3	1565.9 93330.7 52.2	0.005 0.323	1634.8 58177.9 54.5	288920	0.016	0.007	0.201	0.96 1.60
PP-16	30	53.3 527.6 1.8	827.9 24532.0 27.6	881.2 25059.6 29.4	0.007 0.201	994.6 35410.2 33.2	124520	0.061	0.004	0.284	0.89 0.71
RR-2	30	71.1 2639.9 2.4	523.5 36020.5 17.4	594.6 38660.4 19.8	0.003 0.185	1283.3 39199.8 42.8	208887	0.120	0.013	0.188	0.46 0.99
RR-4	30	314.7 12613.5 10.5	1550.6 34808.4 51.7	1865.2 47421.9 62.2	0.010 0.260	1233.5 43276.9 41.1	182551	0.169	0.069	0.237	1.51 1.10
RR-6	30	156.4 6666.3 5.2	1428.2 45335.8 47.6	1584.7 52002.0 52.8	0.011 0.366	1924.7 51915.4 64.2	141948	0.099	0.047	0.366	0.82 1.00

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE FIVE SPOT REPORT
SEPTEMBER 1980 (30 DAYS)

WELL	DAYS ACTIVE	OIL PROD CUM OIL DAILY AVE	WATER PROD CUM WATER DAILY AVE	FLUID PROD CUM FLUID DAILY AVE	FLD(PV) CUM FLD(PV)	INJECTION CUM INJ DAILY AVE	PORE VOL	OIL CUT	CUM OIL/ PORE VOL	CUM INJ/ PORE VOL	FLD/INJ CUM FLD/ CUM INJ
RR-8	29	101.4 1696.4 3.4	1460.4 55032.4 48.7	1561.8 56728.8 52.1	0.007 0.246	2550.0 71000.6 85.0	230914	0.065	0.007	0.307	0.61 0.80
RR-10	30	76.2 1349.9 2.6	1678.6 66570.2 56.0	1756.8 67920.1 58.6	0.007 0.255	2349.7 89358.1 78.3	266817	0.045	0.005	0.335	0.75 0.76
RR-12	30	131.6 3330.5 4.4	1300.2 61407.8 43.3	1431.7 64738.3 47.7	0.006 0.290	1438.4 52558.4 47.9	223502	0.092	0.015	0.235	1.00 1.23
RR-14	30	49.8 2846.0 1.7	284.5 10824.4 9.5	334.3 13670.4 11.1	0.004 0.170	1063.7 33902.9 35.5	80481	0.149	0.035	0.421	0.31 0.40
TT-2	30	5.3 475.0 0.2	674.3 39927.8 22.5	679.6 40402.9 22.7	0.006 0.370	313.8 37112.3 10.5	109198	0.008	0.004	0.340	2.17 1.09
TT-4	30	183.1 5688.7 6.1	2054.1 66117.4 68.5	2237.2 71806.1 74.6	0.028 0.897	1223.7 32189.9 40.8	80067	0.082	0.071	0.402	1.83 2.23
TT-6	30	26.7 383.5 0.9	1803.8 64522.3 60.1	1830.4 64905.9 61.0	0.035 1.232	1310.7 29924.8 43.7	52686	0.015	0.007	0.568	1.40 2.17
TT-8	30	76.4 383.4 2.5	697.0 24936.4 23.2	773.5 25319.8 25.8	0.007 0.232	526.1 23321.9 17.5	109336	0.099	0.004	0.213	1.47 1.09
TT-10	30	147.6 4515.6 4.9	523.5 29268.9 17.4	671.0 33784.5 22.4	0.005 0.245	642.7 34454.0 21.4	138176	0.220	0.033	0.249	1.04 0.98
SC-14	0	0.0 910.9 0.0	0.0 29429.5 0.0	0.0 30340.4 0.0	0.0 0.346	880.0 24031.4 29.3	87710	0.0	0.010	0.274	0.0 1.26

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE FIVE SPOT REPORT
SEPTEMBER 1980 (30 DAYS)

WELL	DAYS ACTIVE	OIL PROD CUM OIL DAILY AVE	WATER PROD CUM WATER DAILY AVE	FLUID PROD CUM FLUID DAILY AVE	FLD(PV) CUM FLD(PV)	INJECTION CUM INJ DAILY AVE	PORE VOL	OIL CUT	CUM OIL/ PORE VOL	CUM INJ/ PORE VOL	FLD/INJ CUM FLD/ CUM INJ
BP-18	30	10.7 112.8 0.4	42.7 6740.8 1.4	53.3 6853.6 1.8	0.001 0.083	1288.8 70149.4 43.0	82228	0.200	0.001	0.853	0.04 0.10
TOTAL		3666.0 117652.1 122.2	57997.0 2407150.3 1933.2	61663.0 2524801.8 2055.4	0.008 0.333	72930.9 2282941.0 2431.0	7591755	0.047	0.015	0.301	0.85 1.11

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE SULFONATE REPORT

* SULFONATE IN WATER, %

WELL NO.	2-77	3-77	4-77	5-77	6-77	7-77	8-77	9-77	10-77	11-77
XA-10	.20	**	**	**	.04	0.0	**	**	.68	.09
XA-12	.05	.06	**	**	.04	.01	0.0	.04	.07	.08
XA-14	.02	.06	.03	**	.04	.02	.01	.04	.01	.05
AA-11	**	**	.37	**	.05	.03	.08	.02	.01	.05
B-0	.06	.06	.03	**	.07	.03	0.0	.01	.01	0.0
EB-5	**	**	**	**	**	**	**	.03	.01	0.0
B-4	.04	.06	.03	**	.05	.03	.14	.04	.03	.40
B-6	.06	.06	.03	.40	.25	.08	0.0	.07	.05	.07
B-8	.09	.06	**	.10	.04	.03	.01	.06	.09	.05
B-10	**	.11	.07	**	**	**	.07	.17	2.50	.41
B-12	.10	.23	.07	**	.16	.10	**	**	.25	.44
B-14	.07	.06	.03	.10	.13	.09	.09	.10	.07	.07
B-16	.06	.06	.07	.05	.09	.08	.03	.03	.02	.05
D-0	.04	.06	.03	.05	.05	.03	.03	.01	.01	.04
D-2	.05	.06	0.0	**	**	.03	.07	.04	**	.32
D-4	.04	.06	.07	**	.05	.03	.09	.18	.10	.39
D-6	.25	.23	.23	.40	.27	.10	.20	.16	.14	.24
D-8	.14	.11	.13	.10	.22	.22	.11	.09	.07	.13
D-10	.06	.06	.03	.02	.05	.03	.02	.04	0.0	.05
F-0	.06	**	.07	**	.05	.05	.05	.02	0.0	.04
F-2	.04	.06	.07	**	.13	.08	.05	.03	.01	0.0
F-4	.11	.11	.13	.10	.14	.12	.12	.11	**	.05
F-6	.18	.23	.20	.30	.34	.14	.18	.20	.10	.20
F-8	.09	.06	.13	.10	.14	.22	.09	.08	.02	.09
F-10	.05	.06	.07	.07	.09	.08	.06	.07	.00	.08
F-12	.05	.06	.03	.50	.29	.07	.05	.04	.02	.08
F-14	.06	**	.03	.80	.20	.03	5.94	4.56	5.93	6.80
H-0	.04	.06	.03	.30	.27	0.0	.05	.04	.00	.00
H-2	.10	**	**	.10	.27	.08	.08	.11	.14	.23
H-4	.08	.06	.07	.10	.20	.08	.11	.21	.03	.08
H-6	.14	.11	.10	.20	.25	.17	.12	.10	.03	.11
H-8	.14	.06	.13	.20	.24	.14	.15	.16	.13	.29
H-10	.08	.00	.07	.02	.09	.02	.07	.08	.07	.17
H-12	.06	.00	.03	**	.09	.02	**	.05	.00	.07
H-14	.06	.06	.07	**	.20	.08	.12	.13	.08	.19
J-0	.04	.00	.03	**	.05	0.0	.06	.05	**	.08
J-2	.07	.06	.07	.07	.07	0.0	.07	.04	**	.08
J-4	.08	.06	.13	**	.14	.05	.12	.12	**	.13
J-6	.06	.06	.07	.07	.13	.04	.10	.08	.00	.08
J-8	.96	.46	.07	.02	.07	.05	.07	.06	.00	.08
J-10	.06	.11	.07	**	.07	.05	.11	.07	**	.08
J-12	.41	.06	.10	.70	.74	.49	.49	.43	**	.08
J-14	.70	.11	.13	.20	.29	.16	.17	.13	.08	.16

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE SULFONATE REPORT

* SULFONATE IN WATER, %

WELL NO.	12-77	1-78	2-78	3-78	4-78	5-78	6-78	7-78	8-78	9-78
XA-10	.09	**	0.0	**	.17	3.5	3.2	**	**	**
XA-12	.11	.11	.08	.04	.17	0.0	.07	.08	**	.11
XA-14	.07	.12	.08	.01	.17	.05	.14	.14	.18	.23
AA-11	.05	0.0	.05	**	.16	0.0	**	**	.09	.13
B-0	.05	.70	.05	0.0	.12	0.0	.07	.03	.05	.09
EB-5	**	1.02	.07	0.0	**	0.0	.04	.03	.08	.09
B-4	.27	.26	.37	.54	.42	.90	1.1	1.1	2.84	1.53
B-6	.11	.13	.08	0.0	.13	0.0	.88	.07	**	.08
B-8	.07	.11	.28	.18	.10	.23	.41	**	.53	.56
B-10	2.0	4.11	0.0	**	**	0.0	**	**	**	**
B-12	.83	.55	.11	.03	.94	.60	**	1.3	1.00	.88
B-14	.12	.16	.14	**	.18	.06	.14	.14	.13	.15
B-16	.07	.13	.07	0.0	.12	0.0	.10	.07	.08	.09
D-0	.08	.14	.07	0.0	.13	0.0	.12	.09	.13	.15
D-2	.96	.47	.32	.21	.39	.17	.27	.03	.34	.38
D-4	.37	1.29	.05	.21	.70	1.67	**	2.7	**	3.94
D-6	.13	.25	.50	0.0	.73	.40	.59	.70	.68	.79
D-8	.05	.17	.11	.01	.17	0.0	.10	.11	.13	.11
D-10	.05	.14	.08	0.0	.09	0.0	.03	.03	.07	.04
F-0	.23	.12	.09	0.0	.10	0.0	.08	**	.08	.09
F-2	.14	.14	.16	**	.10	0.0	**	.07	.11	.15
F-4	.09	1.4	1.22	1.20	1.49	1.22	1.9	2.2	2.80	2.89
F-6	.05	.22	.16	.21	.23	.10	.22	.22	.25	.25
F-8	.07	.15	.05	0.0	.12	0.0	.10	.09	.12	.13
F-10	.05	.16	.05	0.0	.11	0.0	.08	.05	.09	.10
F-12	.07	.14	.36	0.0	.09	0.0	.08	.03	.07	.05
F-14	7.1	8.36	10.6	.26	9.52	8.8	5.7	8.0	9.60	9.7
H-0	.17	.13	.06	0.0	.08	0.0	.10	.07	.09	.11
H-2	.08	.16	.18	0.0	.22	0.0	.23	.22	.22	.28
H-4	.08	.17	.09	0.0	.14	.07	.12	.11	.37	.19
H-6	.34	.12	.13	.12	.21	.36	.29	.23	.21	.25
H-8	.15	.13	.08	0.0	.60	.20	.66	.95	1.17	1.38
H-10	.07	.18	.18	0.0	.25	.16	.40	**	**	.30
H-12	.20	.14	.07	0.0	.09	0.0	.10	.06	.11	.11
H-14	.07	.26	.20	.16	.22	.16	.41	.41	.47	.40
J-0	.07	.13	.07	0.0	.09	0.0	.08	.05	.08	.07
J-2	.14	.11	.16	.04	.10	.16	.08	.06	.08	.13
J-4	.06	.16	.14	.03	.17	.07	.16	.15	.14	.18
J-6	.37	.12	.09	0.0	.10	0.0	.08	.09	.09	.10
J-8	.08	.14	.07	0.0	.09	0.0	.08	.09	.09	.11
J-10	.36	.14	.38	0.0	.08	.35	.04	.08	.09	.10
J-12	.15	.46	.39	.34	.43	.33	.49	.49	.47	.49
J-14	.05	.22	.22	.09	.18	.13	.21	.23	.22	.19

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE SULFONATE REPORT

* SULFONATE IN WATER, %

WELL NO.	10-78	11-78	12-78	1-79	2-79	3-79	4-79	5-79	6-79	7-79
XA-10	**	**	**	**	**	**	2.67	**	**	**
XA-12	.17	.19	.28	.24	.82	1.8	3.06	11.7	6.06	8.53
XA-14	0.0	.30	.43	.67	.65	.91	.90	.99	**	1.09
AA-11	.14	.19	.63	.39	.76	1.33	1.61	**	6.22	9.98
B-0	.07	.15	.10	.32	.06	.25	.51	.28	**	0.55
EB-5	.10	**	5.7	3.0	.08	**	**	.10	.12	0.09
B-4	1.96	1.4	**	4.3	5.3	.29	6.58	.15	11.4	12.6
B-6	.14	.18	5.5	.35	.8	.28	1.37	.35	1.62	0.91
B-8	.96	.61	.80	1.1	1.2	2.03	1.93	2.64	2.63	2.96
B-10	**	**	**	**	**	**	2.39	.21	**	**
B-12	1.29	.69	.8	.62	**	2.46	2.64	4.64	5.56	8.44
B-14	.17	.09	.16	.30	.11	.28	.31	.16	.57	.82
B-16	.12	.10	.10	.32	.13	.22	.17	**	.20	.21
D-0	.22	.13	.35	.37	.23	.32	.43	.43	.46	.42
D-2	.46	.24	.25	.57	.61	1.33	1.03	1.42	1.36	1.54
D-4	.09	2.03	.51	4.0	5.1	5.48	6.12	7.5	10.0	11.5
D-6	**	.62	.51	.24	3.5	**	6.09	6.89	8.34	8.44
D-8	.16	.10	.18	.25	.13	.38	.72	.43	.41	.39
D-10	4.3	**	.10	**	.06	**	.18	.20	.16	.30
F-0	.09	.08	**	.39	.12	.19	.21	.18	.18	.24
F-2	.20	.11	**	.37	.57	.42	.31	.5	.74	.62
F-4	3.19	1.87	**	**	4.1	5.09	3.67	5.5	5.24	9.42
F-6	.33	.16	.25	.30	.39	.87	1.38	2.25	2.14	2.01
F-8	.13	.06	.10	.25	.06	**	.41	.89	1.62	2.64
F-10	.09	.11	.13	.32	.11	.36	.17	.25	.20	.22
F-12	.10	.10	.13	.25	.14	.25	.19	.25	.23	.19
F-14	9.8	6.0	18.3	9.6	**	3.81	6.60	7.78	8.9	9.52
H-0	.10	.10	.13	.32	.16	.57	.79	.78	.76	.87
H-2	.29	.20	.16	.21	.67	.28	1.22	1.78	1.95	2.34
H-4	.30	.17	.16	.38	.25	.33	.32	.88	1.34	2.35
H-6	.43	.23	.23	.70	**	.75	1.27	1.45	2.61	3.21
H-8	2.06	1.25	1.75	.78	1.2	.69	1.52	1.88	2.03	1.74
H-10	.36	.18	.10	.25	1.4	2.54	**	5.21	3.03	4.06
H-12	.13	.10	.12	.27	.17	.56	1.23	2.88	4.54	6.82
H-14	.52	.31	.35	.57	1.4	2.88	2.48	7.45	10.7	12.6
J-0	.09	.10	.16	.26	.16	.22	.29	.5	.55	.60
J-2	.16	.11	.23	.33	.27	1.74	2.21	3.24	3.27	3.70
J-4	.19	.12	.20	.35	.91	.35	.46	.61	.82	1.02
J-6	.32	.10	.18	.30	**	.20	.20	.21	.28	.21
J-8	.17	.09	.20	.36	.11	.69	.43	.58	.76	1.09
J-10	.13	.11	.13	.32	.26	.33	.31	.58	.78	.94
J-12	.52	.24	.18	.34	.29	.13	.30	.45	.35	.33
J-14	.22	.15	.18	.27	.11	.20	.19	.38	.51	.57

MARATHON OIL COMPAY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE SULFONATE REPORT

WELL ID	8-79	9-79	10-79	11-79	12-79	1-80	2-80	3-80	4-80	5-80	6-80	7-80
XA-10	2.67C	2.67C	1.45	2.32	2.32C	.38	9.03	10.38	10.80	10.80	10.01	10.01
XA-12	9.39	9.39C	11.30	9.08	9.80	8.22	10.00	11.23	11.00	11.36	9.12	8.72
XA-14	.95	1.39	1.87	2.99	2.93	3.73	5.55	6.59	10.50	6.44	8.45	9.21
AA-11	9.98C	9.98C	12.50	9.27	10.20	11.80	11.10	12.78	16.30	10.13	9.45	8.69
B-0	.37	.50	.89	1.42	.72	.92	.92	.93	.38	.49	.50	.79
EB-5	.13	.20	2.91	4.65	.36	.51	.28	.20	.44	.44C	.44C	.44C
B-4	12.30	12.30C	15.80	15.20	9.98	19.90	19.90	27.30	31.00	31.00C	31.00C	20.90
B-6	.67	.94	1.06	1.69	.84	.84C	.34	.34C	.34C	.34C	.34C	6.45
B-8	2.96C	3.90	4.16	6.65	4.66	.69	5.26	8.31	8.85	6.23	6.56	8.05
B-10	.21C	.21C	2.04	2.04C	2.04C	2.04C	2.04C	2.04C	2.04C	.34	.99	.99C
B-12	8.44C	10.20	.48	.77	.90	8.57	11.20	13.76	16.90	12.59	9.41	11.81
B-14	.63	1.50	2.06	3.29	2.78	2.50	5.41	3.9	4.36	2.56	3.28	3.59
B-16	.06	.36	.43	.69	.67	.60	1.46	.59	.18	.31	.67	.79
D-0	.51	.52	.57	.91	.81	.61	.64	.95	.33	.33C	.30	.39
D-2	1.15	2.01	2.06	3.29	3.71	2.10	2.73	4.06	4.38	3.48	4.19	4.74
D-4	11.50C	11.50C	14.50	14.60	10.40	11.30	15.00	28.81	16.90	15.16	17.91	16.37
D-6	8.36	10.20	10.50	10.90	8.28	7.40	8.27	9.23	10.90	10.39	7.73	7.53
D-8	.39C	.52	.52	.52C	.86	.60	.87	.80	.24	.61	.61	.61C
D-10	.46	.46C	2.06	3.09	.95	.54	.84	.99	1.04	.77	.40	1.11
F-0	.22	.44	.65	.97	.79	.62	.61	.79	.66	.61	.77	.86
F-2	.79	1.01	1.34	2.01	1.34	.76	.76C	1.10	1.10C	1.48	1.61	1.88
F-4	9.42C	4.69	4.84	7.27	5.79	7.68	7.68C	.78	.78C	33.60	25.16	29.04
F-6	2.29	2.91	2.72	4.09	3.78	4.16	5.74	6.79	4.61	12.53	6.13	6.67
F-8	3.70	4.42	4.06	6.11	3.66	2.58	2.58C	2.83	3.00	1.99	2.17	2.21
F-10	.30	.57	.73	1.10	1.04	.69	.36	1.35	1.66	1.25	1.22	1.69
F-12	.11	.11C	.33	.50	1.00	.67	.23	1.27	.23	.23C	1.21	.14
F-14	8.41	9.66	11.40	12.00	7.76	5.98	6.41	7.39	7.70	4.69	5.03	4.97
H-0	.89	1.49	2.15	3.25	2.48	2.07	2.50	3.05	3.36	2.19	2.28	3.26
H-2	2.59	3.47	3.50	5.29	3.47	2.98	1.03	4.24	4.49	3.35	3.59	3.50
H-4	3.38	5.26	5.60	8.47	5.96	5.22	5.87	6.51	4.33	5.08	5.25	6.04
H-6	3.56	5.71	3.89	5.89	4.28	3.54	5.07	4.91	4.91C	5.03	4.90	5.98
H-8	1.73	2.39	2.46	3.73	2.69	2.07	3.32	3.37	3.11	2.33	2.70	3.19
H-10	4.61	4.19	5.99	9.09	6.07	6.13	6.37	7.06	7.97	4.87	4.62	4.18
H-12	8.95	7.27	7.52	11.4	6.38	6.30	8.71	10.13	11.10	8.28	8.71	9.38
H-14	12.20	14.30	14.80	12.50	14.20	14.10	18.10	18.51	22.30	16.54	17.02	13.55
J-0	.56	1.04	1.10	1.67	1.00	.85	1.15	1.31	.81	.85	1.40	1.44
J-2	2.40	2.94	3.32	5.05	.75	3.57	.84	1.00	6.22	6.17	1.27	8.23
J-4	.91	1.50	1.82	2.77	1.97	2.63	2.73	3.41	4.05	6.09	2.79	3.60
J-6	.71	.37	.61	.93	4.17	2.18	1.26	1.88	2.18	2.16	2.88	3.12
J-8	1.54	2.21	2.43	3.70	2.71	2.72	3.64	4.30	4.57	3.19	3.21	4.20
J-10	1.36	2.04	2.35	3.58	2.88	2.55	2.55C	2.02	2.74	2.05	2.80	3.03

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE SULFONATE REPORT

WELL ID	8-80	9-80
XA-10	10.01	10.01C
XA-12	9.39	9.39C
XA-14	8.84	11.04
AA-11	7.09	7.07
B-0	.69	.74
EB-5	.00	0.00
B-4	24.40	19.55
B-6	.36	.36C
B-8	6.90	6.76
B-10	.99C	8.22
B-12	11.44	8.26
B-14	3.63	3.93
B-16	.69	.87
D-0	.41	.54
D-2	4.78	5.28
D-4	12.50	13.32
D-6	6.36	5.94
D-8	.80	1.10
D-10	.80	.96
F-0	.78	1.05
F-2	.00	4.02
F-4	.15	24.90
F-6	.20	4.82
F-8	.18	2.76
F-10	1.93	2.07
F-12	.65	.30
F-14	6.14	6.07
H-0	3.92	3.99
H-2	.00	4.05
H-4	.00	5.53
H-6	5.87	6.04
H-8	3.25	3.03
H-10	.00	8.14
H-12	.18	3.67
H-14	.21	10.30
J-0	.93	1.33
J-2	.00	1.14
J-4	2.96	3.24
J-6	.00	2.27
J-8	3.74	4.17
J-10	.00	2.70

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE SULFONATE REPORT

* SULFONATE IN WATER, %

WELL NO.	2-77	3-77	4-77	5-77	6-77	7-77	8-77	9-77	10-77	11-77
L-0	.06	.06	.07	**	.09	.01	.07	**	.00	.07
L-2	.04	**	.07	.02	.09	.02	.07	.03	.00	.08
L-4	.04	.17	.07	.05	.09	.04	.08	.07	.01	.08
L-6	.04	.23	.07	**	.14	.06	.07	.07	.02	.08
L-8	.15	.46	.17	.10	.14	.08	.13	.13	.05	.17
L-10	.06	.11	.07	.02	.11	.09	.10	.07	.01	.13
L-12	.08	.11	.10	.10	.16	.07	.14	.10	.05	.19
L-14	.09	.11	.13	.10	.20	.07	.12	.09	.02	.13
N-0	.03	.06	.03	**	.07	.02	.06	.03	.00	.08
N-2	.03	.11	.03	.02	.09	0.0	.08	.09	.02	.11
N-4	.03	.11	.10	.07	.11	**	.05	.04	.01	.13
N-6	.01	**	.03	**	**	.03	.05	.04	.00	.07
N-8	.06	.11	.07	.07	.13	.04	.08	.10	.00	.13
N-10	.10	.11	.10	.07	.13	.06	.12	.08	.02	.08
N-12	.06	.17	.03	**	.09	.03	.07	.07	.03	.12
N-14	.08	.11	.07	.02	.16	.07	.09	.08	.02	.11
P-0	.04	.06	.03	.10	.05	0.0	.05	.04	.00	.04
P-2	.02	**	.03	**	.07	.02	.05	.03	.00	.04
P-4	.02	.11	.03	**	.13	.02	.06	.04	.00	.07
P-6	.03	.11	.03	**	.09	.05	.05	.05	.00	.05
P-8	.08	.11	.03	**	.20	.05	.08	.07	.00	.08
P-10	.06	.11	.07	.07	.11	.06	**	.06	.01	.08
P-12	.06	.06	.07	.05	.09	.04	.08	.08	.00	.07
P-14	.06	.11	.07	**	.09	.04	.06	.05	.01	.07
R-0	.12	.17	.03	.05	.13	.05	.18	.13	.08	.19
R-2	.04	.11	.03	.20	.09	.09	.04	.06	.00	.08
R-4	.04	.11	.03	.07	.07	0.0	.05	.04	.00	.04
R-6	.04	.11	.13	**	**	.04	.05	.05	.02	.08
R-8	.10	.11	.07	**	.11	.04	.08	.10	.02	.09
R-10	.10	.17	.10	.07	.16	.10	.12	.11	.06	.13
R-12	**	.80	**	**	.89	.56	.65	.54	.40	.59
R-14	.10	.11	.07	.10	.14	.06	.16	.13	.07	.08
T-0	.06	.06	.03	.02	.07	0.0	.05	.07	.00	.07
T-2	.04	**	.03	**	.05	.04	.05	.06	.00	.07
T-4	.04	.06	0.0	**	.05	0.0	.08	**	.03	.11
T-6	.04	.11	0.0	**	.07	.10	.06	.06	.01	.08
T-8	.05	.11	.03	.05	.02	.16	.05	.05	.01	.17
T-10	.06	**	.07	.05	.11	.07	.12	.13	.08	.12
T-12	.06	**	.07	.05	.09	.10	.10	.10	.10	.08
T-14	.06	.11	.07	.02	.09	.07	.05	.05	.06	.07
V-0	.07	.11	.10	.07	.07	.06	.08	.10	.05	.08
V-2	.04	.06	.07	.02	.05	.03	.03	.04	.01	.08
V-4	.02	.06	.03	**	.05	.10	.07	.05	.02	.05

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE SULFONATE REPORT

* SULFONATE IN WATER, %

WELL NO.	12-77	1-78	2-78	3-78	4-78	5-78	6-78	7-78	8-78	9-78
L-0	.07	.14	.09	0.0	.10	0.0	.11	.06	.12	.09
L-2	.08	.13	.05	0.0	.08	0.0	.08	.07	.09	.09
L-4	.08	.15	.07	0.0	.11	0.0	.12	.07	.09	.10
L-6	.10	.15	.05	0.0	.11	0.0	.23	.08	.12	.11
L-8	.07	.19	.13	.03	.17	.05	.18	.12	.14	.16
L-10	.12	.17	.13	0.0	.14	.04	.12	.11	.14	.14
L-12	.05	.22	.28	.24	.49	.31	.49	.54	.84	1.00
L-14	.04	.13	.11	0.0	.12	.04	.05	.11	.13	.14
N-0	.11	.13	.07	0.0	.08	0.0	.07	.06	.08	.09
N-2	.07	.23	.21	.12	.06	.28	.44	.46	.54	.64
N-4	.04	.16	.08	0.0	.09	0.0	.10	.11	.14	.19
N-6	.07	.13	.03	0.0	.04	0.0	.09	.07	.08	.10
N-8	.06	.16	.08	0.0	.12	.07	.12	.11	.12	.18
N-10	.07	.13	.08	0.0	.08	.05	.14	.11	.12	.14
N-12	.07	.15	.08	0.0	.04	.06	.12	.11	.12	.16
N-14	.04	.15	.09	0.0	.09	.06	.14	.11	.12	.14
P-0	.05	.11	.05	0.0	.07	0.0	.05	.07	.11	.10
P-2	.06	.09	.04	.18	.08	0.0	.05	.08	.11	.08
P-4	.04	.13	.05	0.0	.09	0.0	.05	.06	.09	.09
P-6	.06	.10	.07	0.0	.08	0.0	.08	.07	.09	.10
P-8	.06	.13	.08	.01	.10	.06	.08	.08	.14	.13
P-10	.04	.13	.09	0.0	.08	.07	.08	.09	.12	.04
P-12	.04	.12	.07	0.0	.08	0.0	.10	.08	.11	.13
P-14	.04	.12	.05	.07	.04	0.0	.05	.07	.11	.10
R-0	.05	.22	.17	.07	.04	.13	.18	.16	.18	.20
R-2	.05	.11	.05	0.0	.04	.06	.05	.06	.11	**
R-4	.06	.12	.04	0.0	**	0.0	.05	.06	.21	.09
R-6	.07	.13	.11	0.0	.04	.10	.15	.15	.25	.23
R-8	.10	.14	.09	0.0	.04	.05	.12	.11	.13	.15
R-10	.11	.57	.11	.04	.07	.07	.14	**	.14	.15
R-12	.11	.15	.55	.25	.16	.48	.60	.62	.66	.69
R-14	.03	.22	.17	.07	.09	.12	.22	.01	.25	.29
T-0	.11	.12	.09	0.0	.01	.06	0.0	.05	.09	.11
T-2	.11	.11	.04	0.0	**	0.0	.05	.06	.05	.06
T-4	.05	.20	.37	0.0	.57	.56	.60	.64	.58	.64
T-6	.05	.11	.05	0.0	**	0.0	.10	.08	.08	.08
T-8	.11	.11	.05	0.0	**	0.0	.05	.08	.09	.10
T-10	.16	.19	.22	.07	.10	.12	.19	.19	.01	.21
T-12	.07	.27	.25	.13	.17	.16	.23	.24	.30	.31
T-14	.04	.14	.08	.01	**	.05	.08	.08	.11	.11
V-0	.04	.16	.09	.07	**	.07	.11	.09	.11	.15
V-2	.04	.13	.08	0.0	**	.06	.08	.09	.12	.14
V-4	.58	.30	.05	**	**	0.0	.04	.04	.08	.06

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE SULFONATE REPORT

* SULFONATE IN WATER, %

WELL NO.	10-78	11-78	12-78	1-79	2-79	3-79	4-79	5-79	6-79	7-79
L-0	.13	.12	.15	.31	.60	.81	1.11	1.94	1.77	2.06
L-2	.12	.09	.15	.32	.19	.47	.60	1.36	1.51	2.51
L-4	.16	.11	.11	.33	.15	.31	.17	.3	.21	.20
L-6	.16	.14	.18	.29	.25	.33	.33	.58	.47	.84
L-8	.17	.14	.22	.37	.18	.20	.16	.28	.25	.24
L-10	.23	.12	.20	.30	.14	.47	.46	7.4	.72	.67
L-12	1.39	1.13	1.24	2.2	**	**	6.23	1.21	8.63	11.1
L-14	.16	.09	.14	.24	.12	.53	.69	.23	1.09	.01
N-0	.10	.06	.13	.23	**	**	.18	6.78	.15	.15
N-2	.88	.60	1.14	1.3	3.0	6.38	6.33	1.96	6.83	8.27
N-4	.19	.12	.20	.39	.31	.63	.89	.78	2.37	3.57
N-6	.13	**	.20	.25	.20	.45	.58	1.75	2.3	1.38
N-8	.20	.09	.22	.35	.21	.54	.71	1.0	2.28	2.74
N-10	.16	.09	.18	.33	.14	.33	.43	.46	1.17	1.58
N-12	.16	.09	.20	.33	.12	.26	.35	**	.71	.71
N-14	.13	.09	.09	.31	.08	.19	.18	1.83	.43	.58
P-0	.12	.08	.10	.23	.17	.36	.48	.2	.13	2.08
P-2	.12	.09	.11	.29	.05	.19	.16	.41	.10	.15
P-4	.13	.07	.11	.22	.08	.22	.22	.18	**	.51
P-6	.11	.08	.13	.23	.08	.17	.14	.33	.14	.19
P-8	.13	.07	.11	.24	.08	**	.16	.28	.27	.33
P-10	.16	.10	.11	.23	.13	.22	.22	**	.24	.27
P-12	.13	.10	.18	.23	.63	2.03	2.61	2.98	2.49	**
P-14	.12	.07	.10	.32	.06	.20	.30	.4	.36	.54
R-0	.22	.11	.20	.35	.13	.26	.14	.24	.37	.63
R-2	.16	**	.08	.30	.06	.20	.20	.33	.47	.57
R-4	.15	.08	.15	.32	.08	.19	.22	**	.29	.34
R-6	.22	.31	1.22	1.1	.98	1.44	1.95	3.08	.28	4.78
R-8	.18	.12	.23	.22	.26	.48	.61	.98	1.08	1.52
R-10	.18	.10	.15	.33	.17	.25	.43	.95	1.39	2.51
R-12	1.07	.53	1.34	2.9	.99	1.69	2.16	2.48	4.26	5.89
R-14	.44	.18	.42	.52	.76	6.16	1.55	2.53	2.9	**
T-0	.13	.08	.10	.31	.08	**	.22	.44	.44	.53
T-2	.13	.08	.13	.30	.06	**	.12	.21	.28	.29
T-4	.83	.39	**	.82	.99	1.69	1.41	1.41	1.42	1.74
T-6	.16	.25	.18	.36	.29	.81	.70	1.6	1.49	**
T-8	.12	.14	.13	.31	.07	.26	.30	.68	.44	1.98
T-10	.26	.33	.25	.33	.16	.32	.25	.43	.39	.46
T-12	.45	.55	.43	.51	1.2	2.39	2.64	3.55	3.45	3.66
T-14	.13	.18	.13	.31	.09	.44	.53	1.18	1.03	.98
V-0	.18	.19	.13	.23	.12	.25	.27	.41	.35	.69
V-2	.21	.31	.22	.37	.16	.29	.34	.60	.54	.69
V-4	.11	.18	.13	.30	.15	.39	.47	.7	.54	.55

MARATHON OIL COMPAY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE SULFONATE REPORT

WELL ID	8-79	9-79	10-79	11-79	12-79	1-80	2-80	3-80	4-80	5-80	6-80	7-80
J-12	.30	.55	.62	.95	.74	.64	.54	.83	.69	.69C	.71	.66
J-14	1.03	1.82	2.54	3.88	2.71	.60	2.86	3.11	4.37	2.83	2.27	2.75
L-0	2.28	2.52	2.59	3.96	2.26	2.45	3.60	4.55	5.91	4.25	5.63	6.17
L-2	3.79	5.81	7.61	8.13	8.23	13.20	11.10	13.51	15.50	12.98	8.28	6.11
L-4	.19	.83	.61	.93	1.06	1.24	1.33	1.64	1.45	1.17	1.30	1.44
L-6	1.62	3.10	3.20	4.90	.90	.90C	9.74	14.09	13.09	9.12	7.59	7.75
L-8	.24C	.77	.77	1.18	1.23	1.02	1.71	2.21	2.00	1.67	1.95	2.04
L-10	.77	1.01	.82	1.26	1.39	1.01	2.05	3.02	4.09	2.71	3.14	2.97
L-12	10.70	12.70	13.60	15.90	16.30	10.00	11.80	12.45	15.70	19.63	11.40	11.34
L-14	2.04	2.90	3.45	5.29	3.51	2.93	3.90	4.76	4.42	3.52	4.20	3.79
N-0	.17	.37	.38	.58	.91	.44	.56	.32	2.38	.69	.25	.47
N-2	8.53	9.45	8.52	7.96	6.91	8.30	7.73	6.44	10.00	7.49	7.35	6.07
N-4	4.91	7.86	7.45	8.32	8.93	6.96	8.14	9.44	12.30	8.14	7.59	8.42
N-6	2.68	5.60	5.68	5.50	7.60	5.89	6.69	7.28	10.60	6.81	9.15	9.42
N-8	3.38	7.20	6.99	8.16	10.40	7.94	10.20	12.32	14.60	13.65	13.18	11.42
N-10	3.59	4.35	3.89	3.95	5.30	4.34	5.93	6.69	8.25	5.14	6.41	6.09
N-12	.69	1.09	1.33	1.56	2.48	2.12	2.41	2.41C	4.31	4.13	4.32	4.11
N-14	1.04	.90	1.23	1.37	2.20	2.65	3.32	5.77	6.16	4.66	4.22	5.38
P-0	2.02	2.24	1.87	1.90	1.67	1.09	2.30	2.08	2.40	1.48	2.08	1.74
P-2	5.39	.35	.38	.54	.49	.58	2.04	1.83	.67	.63	.78	1.14
P-4	.76	1.22	1.50	2.11	1.84	1.54	2.09	.86	2.58	1.78	2.29	2.71
P-6	.13	.37	.67	.66	.79	.47	.80	.81	.89	.59	.93	.89
P-8	.44	.94	.67	.69	1.47	.71	1.30	1.28	2.66	1.26	1.16	1.14
P-10	.37	.60	.60C	.73	1.13	1.13C	3.04	5.06	6.60	7.55	4.90	2.08
P-12	2.49C	3.37	3.21	3.45	3.45C	3.02	3.91	3.88	4.88	3.03	3.66	3.17
P-14	.86	1.58	2.41	2.72	3.74	3.62	3.60	5.80	6.61	4.27	4.61	4.33
R-0	1.15	1.05	.96	1.43	1.92	2.07	3.63	7.98	8.03	2.83	3.98	4.11
R-2	.95	1.97	2.27	2.72	8.66	3.41	4.20	4.86	5.89	4.26	4.12	4.48
R-4	.39	.91	.89	.98	.90	.84	1.27	1.26	1.11	.93	4.27	2.00
R-6	5.36	5.86	5.29	5.96	7.89	5.19	6.00	6.92	7.84	3.87	3.95	3.95C
R-8	1.87	3.25	3.25C	3.52	5.54	4.49	6.06	7.49	8.91	6.69	6.28	7.95
R-10	3.37	5.27	5.11	6.20	6.75	4.46	7.68	8.58	11.00	10.54	7.45	7.46
R-12	6.24	11.9	7.91	8.64	7.90	4.53	4.73	8.18	8.21	5.60	5.62	5.62C
R-14	5.23	8.03	7.85	8.98	8.98C	3.73	8.25	9.30	10.30	8.18	12.73	8.40
T-0	.71	1.18	1.21	1.12	1.69	1.27	2.65	5.42	4.55	3.87	3.60	3.52
T-2	.41	.50	.82	1.04	1.47	1.28	2.28	2.19	1.91	1.03	1.26	1.39
T-4	1.58	2.85	3.01	3.99	3.87	2.41	2.80	3.15	3.47	3.55	3.06	2.98
T-6	2.26	4.01	3.56	4.13	5.12	3.64	4.78	5.58	6.39	4.50	5.24	5.06
T-8	1.97	3.91	4.67	4.76	6.75	4.62	5.63	7.05	6.51	3.56	4.46	3.96
T-10	.46C	.91	1.09	1.52	2.15	2.34	2.84	4.26	5.67	3.56	4.59	5.36
T-12	4.11	3.22	5.72	5.83	1.91	5.24	6.17	8.00	8.90	5.37	6.74	6.61

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE SULFONATE REPORT

WELL ID	8-80	9-80
J-12	.00	.68
J-14	2.49	2.26
L-0	6.40	6.84
L-2	5.86	4.92
L-4	1.91	2.06
L-6	7.85	7.35
L-8	2.50	2.68
L-10	3.23	3.14
L-12	11.50	10.10
L-14	4.04	4.10
N-0	.17	.55
N-2	6.45	5.82
N-4	7.66	6.63
N-6	8.07	7.65
N-8	12.00	10.10
N-10	6.92	7.22
N-12	4.56	4.55
N-14	5.48	5.18
P-0	2.17	2.10
P-2	1.42	1.84
P-4	2.71	2.48
P-6	.94	.96
P-8	1.48	1.58
P-10	4.57	4.03
P-12	3.25	3.25
P-14	4.50	4.64
R-0	3.68	1.79
R-2	4.75	4.53
R-4	2.19	2.80
R-6	3.25	3.70
R-8	7.47	8.41
R-10	6.05	5.88
R-12	4.19	4.23
R-14	7.08	7.18
T-0	3.12	4.23
T-2	1.06	1.27
T-4	2.98	2.72
T-6	4.12	4.12C
T-8	3.96	5.26
T-10	4.71	5.52
T-12	5.97	6.49

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE SULFONATE REPORT

* SULFONATE IN WATER, %

WELL NO.	2-77	3-77	4-77	5-77	6-77	7-77	8-77	9-77	10-77	11-77
V-6	.04	**	.03	**	.07	.09	**	.04	.01	.13
V-8	.04	.06	.07	.02	.07	.03	.04	.05	.02	.07
V-10	.06	.06	.07	.05	.13	.05	.15	.13	.14	.20
V-12	.06	.06	.07	.02	.09	.16	.08	.08	.08	.12
V-14	.06	.06	0.0	.02	.09	.03	.03	.06	.02	.07

* CONCENTRATION IN WATER DIVIDED BY CONCENTRATION OF STANDARD 1 % SOLUTION OF M-1 SLUG.
** DATA NOT AVAILABLE
# ANALYSIS INDICATES LEVEL DUE TO OTHER THAN CRUDE OIL SULFONATE.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE SULFONATE REPORT

* SULFONATE IN WATER, %

WELL NO.	12-77	1-78	2-78	3-78	4-78	5-78	6-78	7-78	8-78	9-78
V-6	0.0	.50	.99	.74	.75	.83	1.08	1.2	1.37	1.39
V-8	.05	.13	.05	.03	**	0.0	.08	.08	.08	.01
V-10	.20	.21	.20	.13	.10	.12	.16	.19	.18	.25
V-12	.10	.17	.16	.01	.07	.08	.16	.16	.18	.19
V-14	.05	.14	.09	.07	**	0.0	.08	.08	.11	.13

* CONCENTRATION IN WATER DIVIDED BY CONCENTRATION OF STANDARD 1 % SOLUTION OF M-1 SLUG.
** DATA NOT AVAILABLE
# ANALYSIS INDICATES LEVEL DUE TO OTHER THAN CRUDE OIL SULFONATE.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE SULFONATE REPORT

* SULFONATE IN WATER, %

WELL NO.	10-78	11-78	12-78	1-79	2-79	3-79	4-79	5-79	6-79	7-79
V-6	1.9	2.9	1.84	.23	2.2	3.65	4.38	6.9	7.15	7.79
V-8	.10	.19	.10	.33	.06	.25	.30	.58	.59	.62
V-10	.33	.40	**	.38	.14	.32	.30	.55	.58	.98
V-12	.22	**	.23	.40	.25	.42	.51	.95	.93	1.22
V-14	.16	.29	.23	.98	.17	.42	.25	.31	.96	.35

* CONCENTRATION IN WATER DIVIDED BY CONCENTRATION OF STANDARD 1 % SOLUTION OF M-1 SLUG.
** DATA NOT AVAILABLE
# ANALYSIS INDICATES LEVEL DUE TO OTHER THAN CRUDE OIL SULFONATE.

MARATHON OIL COMPAY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE SULFONATE REPORT

WELL ID	8-79	9-79	10-79	11-79	12-79	1-80	2-80	3-80	4-80	5-80
T-14	.90	1.11	1.11	1.11C	1.84	1.17	4.13	2.29	2.32	2.03
V-0	.86	1.50	1.87	2.46	4.00	3.25	4.10	4.45	4.80	2.96
V-2	.61	.79	.84	.84	1.07	.98	5.06	6.63	7.27	6.66
V-4	.74	1.21	.96	1.73	1.13	1.27	1.93	2.19	2.59	1.91
V-6	7.79C	9.25	7.74	11.60	7.43	5.78	7.87	7.53	9.72	5.19
V-8	.56	1.61	1.12	1.86	1.21	1.04	2.20	1.86	2.18	.86
V-10	.98C	2.46	3.24	6.02	4.51	3.66	4.97	5.12	5.51	3.51
V-12	1.47	2.34	3.18	6.79	6.06	5.13	7.21	7.86	9.98	6.29
V-14	.35C	.68	.8	1.52	1.66	1.05	.89	1.83	2.09	1.38

* CONCENTRATION IN WATER DIVIDED BY CONCENTRATION OF STANDARD 1 % SOLUTION OF M-1 SLUG.
C DATA CARRIED OVER FROM LAST MONTH.
ANALYSIS INDICATES LEVEL DUE TO OTHER THAN CRUDE OIL SULFONATE.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE SULFONATE REPORT

WELL ID	8-80	9-80
T-14	1.46	2.14
V-0	1.76	2.92
V-2	5.11	5.10
V-4	2.63	2.78
V-6	4.92	5.34
V-8	1.06	1.96
V-10	3.26	3.75
V-12	7.61	8.67
V-14	1.77	2.59

* CONCENTRATION IN WATER DIVIDED BY CONCENTRATION OF STANDARD 1 % SOLUTION OF M-1 SLUG.
C DATA CARRIED OVER FROM LAST MONTH.
ANALYSIS INDICATES LEVEL DUE TO OTHER THAN CRUDE OIL SULFONATE.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE SULFONATE REPORT

* SULFONATE IN WATER, %

WELL NO.	2-77	3-77	4-77	5-77	6-77	7-77	8-77	9-77	10-77	11-77
AS-35	**	**	**	**	**	**	**	**	.02	0.0
AS-36	**	**	**	**	**	**	**	.05	.02	0.0
DD-10	.23	.29	.13	.20	.16	.10	.12	.11	.06	.12
DD-12	.06	.11	.07	.09	.09	.15	.07	.07	.03	.07
DD-14	.06	.11	**	.05	.09	.17	.07	.07	.05	.08
DD-16	.06	.11	.07	.09	.11	.05	.11	.08	.07	.48
DD-18	.18	.29	.23	.30	.29	.05	.17	.18	.11	.21
FF-12	.06	.11	.07	.07	.08	.06	.07	.07	.05	.08
FF-14	.06	.06	.03	.05	.09	.15	.08	.07	.05	.07
FF-16	.74 #	.69 #	.83 #	.80 #	.84 #	1.49#	.49 #	.46 #	.35	.49 #
FF-18	.06	.06	.07	.30	.25	.07	.16	.17	.14	.21
FF-20	**	**	**	.10	**	.36	.07	.08	.13	.09
HH-12	.06	.06	.07	.07	.11	.02	.06	.08	.03	.08
HH-14	.06	.06	.07	.07	.11	.54	.09	.08	.03	.08
HH-16	.10	.06	.07	.20	.13	.03	.07	.11	.07	.11
HH-18	.06	.06	.13	**	.09	.92	.15	.08	.13	.08
HH-20	.08	**	.07	**	.07	.10	.10	.08	.11	.08
JJ-12	.06	.06	.07	**	.05	.34	.07	.05	.03	.07
JJ-14	.40 #	.40 #	.03	.60	.67 #	.03	.35	.35	.65 #	.36
JJ-16	.44 #	.51 #	.50 #	.80 #	.82 #	.53 #	.40	.50 #	.44 #	.56 #
LL-12	.04	.06	.07	.05	.07	.05	.12	**	.03	.09
LL-14	.74 #	.69 #	.93 #	1.70#	1.50#	.80 #	.83 #	.77 #	.58 #	.71 #
NN-12	.06	.17	.03	.10	.14	.13	.12	.17	.10	.15
NN-14	.95 #	.97 #	1.10#	2.10#	1.90#	1.26#	1.33#	1.24#	.91 #	1.20#
PP-12	.06	1.31	.03	.09	.09	0.0	.09	.08	.06	.11
PP-14	.42 #	.40 #	**	.70 #	.80 #	.03	.55 #	.56 #	.43 #	.57 #
PP-16	1.39#	.11#	**	2.70#	2.50#	.10	1.45#	1.42#	1.11#	1.30#
RR-2	.02	.00	.03	.02	.05	.03	.07	.05	.03	.08
RR-4	.04	**	.03	**	.11	.04	.07	.06	.03	.08
RR-6	.03	**	.03	.02	.05	.03	.06	.06	.05	.16
RR-8	.05	.06	.07	.05	.07	.03	.07	.07	.07	.07
RR-10	.06	1.60	.60	.20	.31	.13	.17	**	.10	2.10
RR-12	.06	.11	.03	.05	.07	.04	.07	.07	0.0	0.0
RR-14	.32	.11	**	**	.07	.14	.08	.52	.06	.51
TT-2	.05	.11	.07	**	.07	.05	.09	.07	.02	.08
TT-4	.06	.11	.03	.02	.07	.05	.08	.09	.03	.12
TT-6	.06	.11	.07	.02	.09	.04	**	.08	.05	.05
TT-8	.04	.11	.03	.02	.07	.04	.07	.05	.06	.04
TT-10	.05	**	.03	.20	.05	.11	.07	.05	.06	.08
SC-14	**	**	**	.20	**	0.0	.14	.14	.08	.17
BP-18	**	**	**	**	**	**	**	**	**	**

* CONCENTRATION IN WATER DIVIDED BY CONCENTRATION OF STANDARD 1 % SOLUTION OF M-1 SLUG.
** DATA NOT AVAILABLE
# ANALYSIS INDICATES LEVEL DUE TO OTHER THAN CRUDE OIL SULFONATE.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE SULFONATE REPORT

* SULFONATE IN WATER, %

WELL NO.	12-77	1-78	2-78	3-78	4-78	5-78	6-78	7-78	8-78	9-78
AS-35	.13	.09	.01	0.0	0.0	0.0	.08	.06	.09	.09
AS-36	.04	.15	.08	0.0	**	0.0	.08	.07	.08	.10
DD-10	**	.14	.42	.01	.25	.31	.37	.38	.39	.41
DD-12	.04	.13	.09	0.0	**	0.0	.10	.07	.11	.13
DD-14	.05	.14	.09	0.0	**	0.0	.10	.07	.11	.11
DD-16	.10	.21	.17	.07	.06	.12	.19	.20	.22	.24
DD-18	.14	.19	.22	.16	.12	.19	.34	.42	.64	.86
FF-12	.06	.13	.16	0.0	**	0.0	.10	.08	.17	.11
FF-14	.04	.15	.11	.03	**	0.0	.15	.08	.12	.11
FF-16	.10	.43#	.49#	.38	.38	.43#	.51#	.47#	.53#	.51#
FF-18	.13	.22	.18	.05	.11	.16	.23	.18	.26	.25
FF-20	.02	.21	0.0	.08	.04	.09	**	.14	.14	.13
HH-12	.04	.13	0.0	.03	**	0.0	.08	.08	.12	.14
HH-14	.04	.13	.09	.03	**	.09	.14	.09	.12	.13
HH-16	.08	.17	.12	.05	.06	.10	.18	.14	.14	.18
HH-18	.05	.16	.21	0.0	.03	.09	.10	.11	.12	.11
HH-20	.03	.20	.36	.03	.05	0.0	**	.12	.13	.16
JJ-12	.06	.14	.08	0.0	.02	.09	.12	.09	.14	.48
JJ-14	.21	.26	.55#	**	.05	.33	.34	.34	.37	.38
JJ-16	.35	.38	.55#	.46#	.40#	.51#	.58#	.53#	.61#	.53#
LL-12	.03	.13	.04	.01	**	0.0	.10	.08	.12	.10
LL-14	.44#	.69#	.72#	.04	.49#	.62#	.63#	.57#	.55#	.54#
NN-12	.13	.25	.20	.12	.17	.28	.45	.49	.78	.66
NN-14	.77#	1.14#	1.21#	1.17#	1.00#	1.19#	1.18#	1.20#	1.18#	1.13#
PP-12	.18	.36	.25	.21	.35	.47	.84	.65	.67	.65
PP-14	.34#	.51#	.58#	.51#	.45	.64#	.60#	.64#	.64#	.01#
PP-16	.79#	1.08#	1.14#	1.14#	1.00#	1.14#	1.30#	1.30#	1.29#	1.29#
RR-2	.06	.14	.07	.03	**	0.0	.08	.11	**	.11
RR-4	**	.17	.11	.03	.04	0.0	.16	.19	.13	.13
RR-6	.08	.16	.11	0.0	**	0.0	.11	.08	.11	.09
RR-8	.06	.14	.05	0.0	0.0	0.0	.07	.07	.08	.09
RR-10	.04	.11	.08	0.0	0.0	.05	.08	.08	.09	.10
RR-12	.05	.13	.08	0.0	0.0	0.0	.07	.08	.08	.10
RR-14	.50	1.12	.09	0.0	0.0	1.23	.05	.22	**	.16
TT-2	.07	.14	.11	0.0	0.0	.15	.08	.08	.09	.10
TT-4	.09	.20	.14	.05	.04	.09	.16	.12	.21	**
TT-6	.05	.14	.08	0.0	.02	0.0	.10	.08	.12	.13
TT-8	.06	.13	.09	0.0	0.0	0.0	.10	.09	.08	.09
TT-10	.18	.13	.09	0.0	0.0	0.0	**	.07	.08	.10
SC-14	.21	.38	.34	**	.25	.37	.53	**	**	.79
BP-18	**	**	**	**	**	**	**	**	**	**

* CONCENTRATION IN WATER DIVIDED BY CONCENTRATION OF STANDARD 1 % SOLUTION OF M-1 SLUG.
** DATA NOT AVAILABLE
# ANALYSIS INDICATES LEVEL DUE TO OTHER THAN CRUDE OIL SULFONATE.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE SULFONATE REPORT

* SULFONATE IN WATER, %

WELL NO.	10-78	11-78	12-78	1-79	2-79	3-79	4-79	5-79	6-79	7-79
AS-35	.11	.13	.18	.30	.11	**	.17	**	.18	.12
AS-36	.10	.13	.13	.30	.15	**	.16	.18	.20	.19
DD-10	.52	.28	.16	.37	.15	.33	.48	.50	.33	.31
DD-12	.13	.08	.14	.23	.15	.17	.18	.18	.14	.09
DD-14	.13	.15	.14	.22	.35	.19	.16	.23	.16	.12
DD-16	.32	.28	.25	.24	**	.36	.25	.46	.40	.12
DD-18	1.65	2.61	1.86	2.0	4.2	4.55	4.36	**	4.07	4.73
FF-12	.12	.13	.13	.30	.15	.20	.22	.19	.27	.27
FF-14	.13	.15	.16	.31	.24	**	.29	.30	.28	.27
FF-16	.61 #	.48 #	.42 #	.50 #	.67 #	.87 #	.75 #	.88 #	** #	.98 #
FF-18	.28	.23	.24	.21	**	.38	.35	.25	.18	.35
FF-20	.22	.28	.26	**	**	**	.34	**	**	**
HH-12	.12	.13	.14	.32	.23	.20	.33	.23	.18	.21
HH-14	.11	.13	.16	.30	.19	.19	.18	.20	.15	.17
HH-16	.19	.16	.19	.34	.34	.31	.29	.40	.41	.51
HH-18	**	.14	**	.29	.18	**	.18	.20	.23	**
HH-20	.22	**	.26	.38	.33	.38	.30	**	**	**
JJ-12	.16	**	.19	.51	.33	.25	.21	.24	.35	.42
JJ-14	.49	.25	.28	.35	.35	.31	.38	.31	.29	.30
JJ-16	.68 #	.35 #	.38 #	.47 #	** #	.45 #	.39 #	.51 #	.45 #	.57 #
LL-12	.11	.10	.14	.22	.25	.19	.18	.16	.12	.17
LL-14	.74 #	.19 #	.42 #	.31 #	.44 #	.41 #	.48 #	.43 #	.41 #	.42 #
NN-12	1.35	1.37	.98	5.7	**	**	3.94	4.51	3.07	2.82
NN-14	1.43#	.48 #	.71 #	.65 #	.72 #	** #	.63 #	.83 #	.82 #	.84 #
PP-12	1.09	.82	.89	.22	**	5.68	5.52	6.38	5.84	5.85
PP-14	.88 #	.76 #	.58 #	.83 #	1.5 #	1.95#	2.22#	2.68#	2.77#	3.16#
PP-16	1.64#	.61 #	.80 #	.32 #	.65 #	.63 #	.59 #	.65 #	.57 #	.55 #
RR-2	.13	.15	.19	.32	**	.17	.21	.15	.15	.17
RR-4	.16	.20	.25	.38	**	.78	1.28	1.48	1.67	2.24
RR-6	.11	.16	.19	.23	.27	.28	.29	.03	1.58	2.03
RR-8	.06	.10	.14	.22	**	.20	.16	.21	.18	.17
RR-10	.11	.13	**	.23	.20	.14	.15	.13	.14	.15
RR-12	.09	.10	.16	.22	.19	.20	.18	.16	.18	.17
RR-14	.20	.20	.21	.36	.39	**	.26	**	.26	.25
TT-2	.13	.10	.15	.32	.18	.19	.18	.20	.18	.17
TT-4	.38	.62	.36	.45	.39	.62	.58	.63	.55	.96
TT-6	.16	.10	.15	.31	.21	.25	.14	.21	.20	.20
TT-8	.11	.13	.13	.27	.19	.19	.16	0.0	.13	.37
TT-10	.11	.10	.15	.32	.21	**	.18	.23	.27	.35
SC-14	.93	.68	.86	.22	1.3	**	**	1.98	**	**
BP-18	**	**	**	.22	.23	**	.18	.19	.17	.13

* CONCENTRATION IN WATER DIVIDED BY CONCENTRATION OF STANDARD 1 % SOLUTION OF M-1 SLUG.
** DATA NOT AVAILABLE
# ANALYSIS INDICATES LEVEL DUE TO OTHER THAN CRUDE OIL SULFONATE.

MARATHON OIL COMPAY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE SULFONATE REPORT

WELL ID	8-79	9-79	10-79	11-79	12-79	1-80	2-80	3-80	4-80	5-80	6-80	7-80
AS-35	.24	.18	.35	.36	.33	.36	.25	.47	0.00	0.00C	.35	.17
AS-36	.24	.30	.35	.39	.71	.34	.28	.44	0.00	0.00C	.40	3.29
DD-10	.28	.35	.57	.99	.64	.58	.56	1.06	.65	.48	.61	.56
DD-12	.05	.23	.20	.27	.26	.46	.72	.39	2.37	2.37C	2.32	2.32C
DD-14	.08	.21	.26	.33	.34	.41	.37	.5	.52	.38	.69	.69
DD-16	.48	.74	.65	1.34	.91	.80	.70	1.21	.49	.34	1.92	.83
DD-18	4.24	4.68	3.65	5.56	3.46	2.41	2.48	2.94	3.65	2.43	4.69	3.38
FF-12	.19	.35	.45	.04	.74	.70	1.22	1.40	1.53	.97	1.49	1.15
FF-14	.21	.44	.52	1.01	.58	.83	1.20	1.64	1.95	1.23	1.73	1.47
FF-16	.66	1.09	1.82	1.61	1.25	1.10	1.10C	1.97	2.36	1.32	1.95	1.75
FF-18	.32	.67	.80	1.46	1.19	1.12	1.26	1.93	2.21	1.85	2.02	1.92
FF-20	.34C	.34C	1.11	2.38	2.38C	2.38C	1.27	1.27C	.96	.15	4.54	1.14
HH-12	.14	.18	.33	.64	.76	.63	.76	1.15	1.23	.87	1.17	.93
HH-14	.09	.28	.24	.41	.98	.47	.49	.79	.62	.52	.88	2.25
HH-16	.50	.99	1.11	2.23	1.67	1.64	1.49	2.04	2.35	1.44	1.89	1.78
HH-18	.19	.41	.41	.81	.70	.65	.67	1.14	1.29	1.66	1.59	.93
HH-20	.01	.01C	1.13	5.58	.68	.32	1.19	1.19C	.91	.91	2.02	.48
JJ-12	.39	.33	.43	.97	.57	.39	.35	.75	.38	.48	.60	.54
JJ-14	.24	.42	.40	.63	.76	.55	.41	.79	.53	.41	.63	.99
JJ-16	.50	.62	.76	1.31	1.14	.80	.79	1.21	1.24	.82	.97	.10
LL-12	.41	.20	.18	.27	.24	.30	.58	.18	.21	.21C	.21C	.99
LL-14	.31	.57	.45	.64	.77	.64	.66	.61	.57	.44	.54	.10
NN-12	2.21	2.34	1.52	2.35	1.33	.83	.27	1.31	1.24	.62	.91	.49
NN-14	.71	.84	.79	1.31	1.49	.91	4.07	1.16	1.39	.83	.91	.76
PP-12	4.65	6.31	4.23	7.15	6.26	4.10	.21	6.05	7.35	4.97	5.72	4.81
PP-14	3.24	4.19	3.55	6.08	5.69	3.71	4.17	4.88	5.53	3.51	4.10	3.80
PP-16	.44	.67	.54	.84	2.05	1.30	1.32	4.91	.84	.59	.79	.77
RR-2	.08	.13	.23	.33	.49	.44	.51	.33	.43	.73	3.57	2.02
RR-4	1.36	1.91	2.10	2.47	3.48	2.25	3.61	4.11	4.76	3.12	1.35	2.77
RR-6	1.88	2.15	1.82	2.05	2.38	1.43	2.57	2.19	2.03	1.22	.71	.59
RR-8	.06	.25	.23	.37	.49	.45	.50	.66	.75	.45	.71	1.49
RR-10	.06	.25	.35	.43	.82	.31	.41	1.59	1.86	1.36	1.65	1.01
RR-12	.13	.30	.20	.30	.49	.44	.35	1.22	.93	.70	1.05	1.05C
RR-14	.19	.19	.27	.27C	.27C	.36	.49	.59	.73	.63	1.03	1.50
TT-2	.11	.17	.15	.20	.58	.21	.10	.12	.14	.18	.39	.52
TT-4	1.36	1.06	.67	.88	1.20	.72	1.63	2.57	3.04	1.94	2.03	.58
TT-6	.11	.15	.21	.25	.54	.28	.53	.29	0.00	.22	.49	1.38
TT-8	.06	.23	.16	.22	.56	.33	.45	.41	.82	.21	.53	.53C
TT-10	.26	.46	.15	.21	.93	.88	1.41	2.00	2.16	1.34	1.71	1.71C
SC-14	1.98C	1.98C	1.98C	1.98C	1.63	1.63C	.48	1.09	1.09C	1.09C	1.09	.69
BP-18	.02	.30	.68	.94	3.88	.24	.30	.95	.55	.55C	.17	.17

* CONCENTRATION IN WATER DIVIDED BY CONCENTRATION OF STANDARD 1 % SOLUTION OF M-1 SLUG.
C DATA CARRIED OVER FROM LAST MONTH.
ANALYSIS INDICATES LEVEL DUE TO OTHER THAN CRUDE OIL SULFONATE.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE SULFONATE REPORT

WELL ID	8-80	9-80
AS-35	.18	.30
AS-36	.15	.23
DD-10	.46	.66
DD-12	.00	.28
DD-14	.60	.60
DD-16	.72	.70
DD-18	2.85	2.86
FF-12	.96	1.12
FF-14	1.31	1.03
FF-16	1.58	1.49
FF-18	1.76	1.56
FF-20	.00	.00C
HH-12	1.00	1.09
HH-14	.96	1.24
HH-16	2.31	2.24
HH-18	1.55	1.67
HH-20	.48	.48C
JJ-12	.54	.62
JJ-14	1.14	1.14C
JJ-16	.00	.00C
LL-12	.53	.12
LL-14	.00	.00C
NN-12	.94	.78
NN-14	.93	.96
PP-12	5.81	5.39
PP-14	4.69	3.85
PP-16	.73	.76
RR-2	.68	.73
RR-4	3.91	4.02
RR-6	1.12	1.27
RR-8	.59	.85
RR-10	1.89	2.03
RR-12	1.09	1.39
RR-14	1.12	1.43
TT-2	.00	.10
TT-4	1.67	1.56
TT-6	.59	.66
TT-8	.47	.51
TT-10	1.57	1.38
SC-14	.69	.69C
BP-18	.00	.27

* CONCENTRATION IN WATER DIVIDED BY CONCENTRATION OF STANDARD 1 % SOLUTION OF M-1 SLUG.
C DATA CARRIED OVER FROM LAST MONTH.
ANALYSIS INDICATES LEVEL DUE TO OTHER THAN CRUDE OIL SULFONATE.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE CHLORIDE REPORT

CHLORIDES (PPM)

WELL NO.	2-77	3-77	4-77	5-77	6-77	7-77	8-77	9-77	10-77	11-77
XA-10	23560	**	**	21600	11210	10214	**	**	12800	21943
XA-12	23710	24700	**	21700	11570	13584	21059	22320	9820	21943
XA-14	10380	10500	10850	11100	10780	10319	10564	10400	9780	10473
AA-11	**	**	10450	11400	11140	10776	9891	10870	10670	11363
B-0	8920	8890	8800	9110	9520	9302	9040	9180	9000	9582
EB-5	**	**	**	**	**	**	**	9180	9280	0
B-4	7980	7770	7930	7990	8230	7897	10175	9210	15160	13429
B-6	23350	20200	20870	10400	9270	20008	19818	9560	19310	4096
B-8	9320	13200	**	11200	19760	10776	18790	19330	18850	11791
B-10	**	9730	10560	**	**	**	9714	14900	15650	14427
B-12	9470	13400	11720	11800	10420	9337	**	**	13840	14391
B-14	9360	9180	12160	9440	10670	9091	10104	9320	9250	11078
B-16	14170	13800	11900	11200	11680	10986	11061	10980	10490	11007
D-0	8270	8240	9010	8570	9590	8424	9572	8460	8500	9440
D-2	10560	10200	10090	9800	**	9828	10104	9000	**	9653
D-4	14570	12400	13700	12700	8870	11618	11557	9610	12520	13287
D-6	9180	9980	10270	10200	9380	9337	10458	9540	10030	10900
D-8	11000	11100	11030	11100	11280	11759	11025	11010	10880	11506
D-10	12780	12000	12440	12100	12320	11759	11203	12060	10850	11897
F-10	12750	**	10820	10700	10600	8354	8685	10400	10390	10758
F-2	14020	13500	14060	13200	11170	9723	13472	13320	13300	0
F-4	10200	9870	10170	9910	10380	9582	10033	10470	**	13892
F-6	8270	8600	8330	8530	8730	8529	8331	8460	8250	8692
F-8	8160	8170	10850	8570	9410	8213	8154	9110	8000	8442
F-10	9320	9660	9520	9620	10350	9266	10245	9720	9530	9867
F-12	14900	12900	12440	16200	9920	8915	8615	14200	12310	13037
F-14	20180	**	18820	19100	9560	8986	17088	17920	16570	18701
H-0	12020	11400	11070	13000	13190	10425	10210	10040	13370	0
H-2	8090	**	**	11000	13190	8494	11167	8530	13160	13678
H-4	8050	8020	7970	8280	8980	8951	8721	13120	8390	8834
H-6	8340	8530	8360	8750	8990	8459	8508	8030	7680	8193
H-8	8740	8780	8900	9110	9770	8915	8934	8640	8540	8727
H-10	8270	8200	8290	8420	10100	8389	8934	8500	8220	8585
H-12	9510	9290	9300	9580	9340	8951	**	8570	8610	9119
H-14	8010	9170	8440	**	9770	9126	9217	8960	8890	9618
J-0	11290	11300	11360	11100	11460	10741	10884	9470	**	10651
J-2	10490	9800	9730	9470	10280	10776	9572	9570	**	10402
J-4	9290	9440	9450	**	9880	8599	9040	8820	**	8638
J-6	9360	9330	9340	9260	10130	9266	8012	9860	9430	9898
J-8	10600	10700	10670	19100	12610	7406	10281	9750	9350	9574
J-10	10270	9980	10270	10400	12610	10109	10459	10470	**	36
J-12	10160	8170	10240	12000	13370	12390	13046	12060	**	36
J-14	9800	8600	8470	9070	9450	8940	8792	8460	8180	8458

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE CHLORIDE REPORT

CHLORIDES (PPM)

WELL NO.	12-77	1-78	2-78	3-78	4-78	5-78	6-78	7-78	8-78	9-78
XA-10	21590	8999	0	999	9390	2460	02550	0999	999	999
XA-12	21730	9525	20533	10553	20540	21000	20500	20900	**	21930
XA-14	10190	10057	10000	10720	20650	10200	10300	10300	10740	11170
AA-11	10980	**	10730	**	20880	11000	**	**	**	11720
B-0	9213	12386	9060	10025	9240	9100	9800	9600	9880	9780
EB-5	**	**	9210	9543	9940	9300	9300	9900	9880	9810
B-4	9079	6129	7870	8554	8830	8000	8700	9000	11880	8580
B-6	10870	19848	19450	19419	19390	19300	**	19700	**	19980
B-8	8540	11695	18600	20320	10800	19600	20900	**	21000	8580
B-10	16150	17909	0	**	**	10800	**	**	**	**
B-12	16480	15619	7700	12875	15130	15900	**	16200	18040	18680
B-14	9390	8508	9670	**	9185	9000	9800	9100	8900	10150
B-16	10470	9816	10040	10429	10080	10200	9800	10500	10080	10650
D-0	8100	7586	8250	9848	8330	8100	8400	8500	9270	8400
D-2	8420	9260	7790	9384	8950	8500	9400	9000	8820	8690
D-4	12050	11426	19370	9589	10280	11200	**	11600	**	12180
D-6	10420	7966	11230	19437	10270	9800	12000	10300	11130	11870
D-8	10560	10252	10730	10865	10790	10200	11300	11300	12170	12840
D-10	11810	11355	11290	8618	10770	10600	10100	11800	11010	10410
F-0	10250	10766	9560	9763	9680	9700	11100	**	9650	10040
F-2	11690	13918	13430	**	13380	13600	**	14100	14800	14800
F-4	13770	11294	11210	12386	11040	10700	12300	9300	12150	12140
F-6	7970	7654	7880	8182	8240	7700	8500	8600	8840	9040
F-8	8060	7235	7630	8887	7820	7500	8500	7700	8670	8130
F-10	12240	9777	8020	9458	9960	9200	9700	9000	2220	10570
F-12	12030	9582	11550	9699	10110	12500	11400	13000	13190	12680
F-14	18250	19072	17090	11925	18290	17800	18700	19900	19500	19220
H-0	9710	8512	9030	9437	9580	9500	9800	10400	9670	10110
H-2	12750	9922	12770	9501	13750	13100	13300	13900	14850	15280
H-4	8520	9855	7890	8125	8840	11200	8700	9000	9670	8930
H-6	7690	4881	9070	8129	8530	9700	8900	7900	7740	9360
H-8	8490	6650	8580	7842	8160	8200	8300	8400	8660	8570
H-10	8130	8224	7880	9161	7830	8100	8400	**	**	8810
H-12	8560	8926	8480	9125	8700	8700	9000	8800	8880	8980
H-14	9140	9355	8980	8948	9060	8900	9500	9500	9290	9130
J-0	10250	10380	10320	8710	10350	10100	10600	11300	11230	10230
J-2	9360	8274	7710	8689	10500	9300	10000	10400	11250	10610
J-4	8460	5871	8050	9394	8690	8500	8600	9400	9400	8970
J-6	9470	8292	9190	8238	8840	9200	9500	8500	10090	10210
J-8	8060	8327	8970	8958	9580	9100	9200	9500	9810	9290
J-10	9860	10298	11080	10238	8700	10800	**	10900	11180	10790
J-12	11710	11677	10640	11355	11980	11100	10900	10800	12340	13300
J-14	8260	8100	7970	8409	8640	8000	8100	8500	8720	8730

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE CHLORIDE REPORT

CHLORIDES (PPM)

WELL NO.	10-78	11-78	12-78	1-79	2-79	3-79	4-79	5-79	6-79	7-79
XA-10	**	**	**	**	**	**	21240	**	**	**
XA-12	22040	19240	20970	21820	23600	22940	22230	20360	20000	18363
XA-14	10480	10310	10980	11440	11680	10780	11270	10850	**	11766
AA-11	11040	12080	11200	10220	11320	11610	11310	**	10760	9706
B-0	9940	9790	9580	8710	8850	9450	9470	9730	9500	9568
EB-5	9310	**	11540	9140	9070	**	**	9270	9370	8937
B-4	8540	9770	**	9140	8470	16800	8470	12210	7620	6672
B-6	20570	19770	11460	18300	18080	17170	17380	19530	18980	19434
B-8	21380	21360	11740	20160	19420	19270	19110	18870	19950	18601
B-10	**	**	**	**	**	**	19190	12190	**	**
B-12	17510	18110	22830	19270	19270	17880	19370	19320	18860	19058
B-14	9050	8540	8780	8840	9320	9080	9600	9090	9670	9437
B-16	10840	9820	10530	9170	9430	10170	9270	**	9750	10245
D-0	9390	8410	15050	8350	8160	8240	8310	8120	8330	8348
D-2	10410	9250	15010	8270	8990	9210	8850	8660	8650	8735
D-4	9850	10750	18090	10800	10430	9310	9310	8770	8620	7530
D-6	**	10590	13230	9740	9400	**	9500	9150	9040	8526
D-8	12100	11760	12120	10730	10500	10650	10880	10660	10780	10454
D-10	11420	**	9360	**	8130	**	10640	10580	9980	11103
F-0	9500	9770	**	9750	9980	10710	10410	10660	10620	10181
F-2	14980	14910	**	14480	14210	14250	14180	14710	13970	14308
F-4	11900	13560	**	**	10740	10050	8550	10410	10440	10043
F-6	9230	8340	8860	8800	8000	8010	7810	7780	7720	7632
F-8	7810	8370	7900	6760	7780	**	7530	7480	7240	7111
F-10	9700	10310	10480	8210	10140	9360	9470	9840	9750	9579
F-12	12500	13120	12540	11500	12440	12520	11840	11850	11380	10933
F-14	19990	19430	17870	16660	**	12270	14190	14030	13910	14201
H-0	10440	10390	10300	10500	11100	10640	8810	10760	10870	10982
H-2	14460	15250	10300	15000	14370	10740	14500	15490	14400	13946
H-4	8110	9040	8710	8710	8740	8870	10760	9580	8860	8586
H-6	10280	8950	9180	7830	**	7680	7590	7490	7700	7133
H-8	8410	8170	7970	6850	7920	6730	8160	8450	8920	8132
H-10	9010	8840	8760	7950	7920	7650	**	7420	8490	7586
H-12	8880	8560	8860	9220	9270	9260	8840	8680	8460	8171
H-14	9770	9150	8660	8670	9360	9470	8970	8020	7670	6466
J-0	10180	10320	9090	9860	**	10090	10050	10080	10780	9632
J-2	11230	12270	10240	9930	8390	7140	9060	9010	9480	9362
J-4	10340	9710	9150	8950	7740	8080	8410	8560	9000	8646
J-6	10140	9480	8770	8370	**	9010	8980	9110	9470	9061
J-8	8730	9060	9460	10580	8750	6640	8110	8340	8960	8738
J-10	11860	10340	10670	8950	10500	10390	9360	8820	8920	8504
J-12	12660	11980	8040	12470	12370	4400	10150	9990	10320	10323
J-14	8720	9250	8040	7540	7720	7890	7870	8040	7910	7767

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE CHLORIDE REPORT

WELL ID	8-79	9-79	10-79	11-79	12-79	1-80	2-80	3-80	4-80	5-80	6-80	7-80
XA-10	21240C	21240C	13021	13910	13910C	9398	13630	13250	13170	13170	12723	12425
XA-12	16782	16782C	14712	14740	13818	13549	14250	13890	12220	12870	12532	10209
XA-14	11667	13080	13039	13120	13092	12847	12860	12560	10060	12210	11567	6576
AA-11	9706C	9706C	8730	7920	7242	6257	7560	7030	5420	6570	6430	8916
B-0	9692	9680	9809	9700	9614	9366	9290	9310	9480	9730	8717	8685
EB-5	8707	9240	11270	9280	9100	9015	9190	9110	9280	8790	9338	3474
B-4	4945	4945C	4803	4240	19824	4757	4757C	4520	4100	3580	9260	11230
B-6	19076	8510	20015	19720	20256	7075	20220	20220C	20220C	21070	20487	14737
B-8	18601C	17830	18409	15390	16272	11000	17520	16100	15800	16030	15127	9000
B-10	1219C	1219C	9841	9841C	9841C	9841C	9841C	9841C	9841C	9500	9000	11518
B-12	19058C	17130	9919	16310	15431	14570	15380	12970	12370	11950	11960	8207
B-14	9302	10070	9635	9710	9678	9511	9430	9190	12630	8550	8590	9072
B-16	8990	9580	9635	9620	9621	9536	9690	10010	9620	9360	9150	8036
D-0	8497	8320	8820	8920	8515	8561	8561C	8730	8410	8380	8593	8161
D-2	8870	9040	9022	9070	8820	9143	9420	9840	9050	9090	8334	4928
D-4	7530C	7530C	6108	7040	6902	6597	5850	7010	6390	5340	5626	6650
D-6	8444	8050	8012	7900	7686	7480	6960	9080	7060	7040	7058	8076
D-8	10454	11140	11121	11121C	11014	10738	10940	18180	11440	11010	12719	10025
D-10	11305	11305	9543	10750	10529	10220	11260	10770	10980	11400	8200	10394
F-0	10185	10590	10238	14310	10511	10646	11070	10270	10290	11370	11447	15506
F-2	14148	14500	14797	14450	13797	14662	14662C	14900	14900C	15160	17487	7611
F-4	10043	10870	11390	14090	11234	10841	10841C	10450	10450C	8610	8132	5520
F-6	7824	7810	8068	9120	7590	7203	6930	6740	8580	6180	5983	6991
F-8	7175	7110	7983	6880	7324	7154	7154C	7960	8180	7560	7515	9199
F-10	9681	9840	9742	9440	9781	9564	12050	10160	9770	10130	9855	12166
F-12	11351	11351C	11348	11470	9798	9143	12450	10150	12160	13480	9075	12010
F-14	14361	14000	12283	12800	12946	12624	13860	12980	14720	14010	12478	9947
H-0	10894	11140	11461	13070	10603	10171	10171C	10560	10390	10090	11574	12620
H-2	13801	14080	14875	8400	13489	11564	15780	13590	13900	13410	12974	6771
H-4	8685	8650	7824	8170	8061	7760	8280	7920	14070	7180	7941	5392
H-6	7037	7000	6994	6710	6622	6750	7110	6860	6860C	6220	6594	7501
H-8	8299	8580	8061	5640	7959	7565	9720	8240	7940	8280	8242	6537
H-10	7608	7760	6480	6700	6796	6782	8880	6760	6680	6810	6842	5793
H-12	7342	8200	7728	8150	7537	7040	6930	6700	6600	6410	6785	2918
H-14	5778	4880	4034	3700	3822	3474	3410	3320	3030	3060	2946	9947
J-0	9745	10000	7966	10830	10550	10188	10040	9830	10250	10260	10263	7632
J-2	9316	9680	9738	10070	9915	9416	10270	10320	9810	9050	11000	7221
J-4	8253	8200	8196	8360	8207	8352	8270	7870	7780	7970	7937	5828
J-6	8827	9420	9270	9440	6544	8093	9140	8800	8730	8830	8629	7413
J-8	8671	8280	7785	8300	8416	8341	8440	8520	8340	8260	8154	9915
J-10	8565	8690	8806	9430	8820	8884	8884C	11250	11100	10790	10117	9589

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE CHLORIDE REPORT

WELL ID	8-80	9-80
XA-10	12723	12723C
XA-12	12340	12340C
XA-14	8774	9752
AA-11	5892	5980
B-0	9040	8781
EB-5	8965	8678
B-4	3612	3375
B-6	14421	14421C
B-8	13914	13592
B-10	11518C	11592
B-12	10525	12269
B-14	7455	7806
B-16	9029	9139
D-0	8412	8278
D-2	7912	5263
D-4	5403	4892
D-6	6704	6725
D-8	10795	10334
D-10	11170	9983
F-0	8370	10713
F-2	8299	14382
F-4	11819	7164
F-6	8806	10447
F-8	11060	7040
F-10	9252	9692
F-12	12120	12273
F-14	9320	11660
H-0	9036	9930
H-2	9749	12592
H-4	9079	6693
H-6	5034	5183
H-8	8097	7483
H-10	7941	5651
H-12	6750	6356
H-14	7611	2790
J-0	10912	10142
J-2	9777	8806
J-4	6895	7239
J-6	8877	5360
J-8	7774	6991
J-10	6757	5750

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE CHLORIDE REPORT

CHLORIDES (PPM)

WELL NO.	2-77	3-77	4-77	5-77	6-77	7-77	8-77	9-77	10-77	11-77
L-0	8740	8780	8510	9070	9950	9021	9501	**	9110	9358
L-2	8920	**	8830	9040	8590	8705	8579	8100	8000	8674
L-4	8780	8490	8690	9110	9410	8599	9253	8710	8540	8638
L-6	8740	8530	8400	8710	9660	8424	8544	8280	8040	8350
L-8	8090	8170	8150	8310	9380	8389	8544	8310	8070	8278
L-10	8120	8170	8110	8530	8870	8179	8225	8060	8000	8674
L-12	9180	9260	9230	9980	9880	9302	9359	9030	8890	9034
L-14	8010	8020	8150	8530	9590	8424	8508	8240	8180	8278
N-0	8740	8460	8440	9040	9380	9056	8969	9030	7220	9358
N-2	7360	7330	7280	7990	9410	7546	8047	7920	7650	12058
N-4	13150	12400	9050	9260	10670	**	12018	9860	11920	7846
N-6	9830	**	9730	9980	**	9372	10033	12240	10310	10078
N-8	9360	9150	9340	9260	10420	9056	8934	8890	10240	8998
N-10	8010	8130	8470	8530	9380	8740	9040	9000	9670	9574
N-12	8230	8390	8290	8350	9630	8213	8508	8280	8220	8278
N-14	8520	8420	8440	8460	10240	8459	8863	8670	8390	8278
P-0	10160	10000	9080	10200	10530	9723	9785	10110	9780	10042
P-2	8920	**	8650	8930	9410	8670	9005	10190	8710	10152
P-4	10200	10100	8290	12000	9200	9617	9891	10150	10350	10473
P-6	8270	8200	8150	9760	8800	8248	8615	8280	8220	8513
P-8	8160	8130	8110	9510	8770	8284	8437	8240	7860	8335
P-10	8920	8930	9050	9840	10060	9266	**	9650	9750	9938
P-12	8190	8170	8470	9110	8410	8178	8118	7160	8000	8371
P-14	8410	8350	8830	10600	9200	8354	7941	8280	8220	8549
R-0	9980	9980	9730	11000	9770	7827	9643	10080	9820	10010
R-2	8410	8530	8900	9470	8800	7862	8544	8670	8360	8371
R-4	11840	11300	11790	12200	12860	12180	9572	13010	12200	12574
R-6	16100	16100	10450	14200	**	13303	9926	13680	9640	14035
R-8	9650	9840	10090	10900	10100	9512	10068	10040	9780	9974
R-10	10020	10100	10310	10900	10350	9477	10387	10080	9820	10294
R-12	**	14900	**	**	15810	13900	13897	13680	13160	13714
R-14	14640	14200	14100	14500	14340	13163	14145	13210	12240	8513
T-0	8740	8310	8760	9600	8690	7968	8331	8280	8180	8478
T-2	7580	7660	8040	9200	8050	7546	8012	7740	17070	7943
T-4	11840	11600	11100	11900	10780	8951	11167	**	10350	10686
T-6	16390	**	16120	16900	8800	16568	17903	17490	16930	17454
T-8	8090	8240	8550	8780	16850	8319	8650	8460	8180	8763
T-10	9030	**	9190	9470	8800	8354	8969	8640	8430	12717
T-12	8230	**	8510	9070	8440	8178	8508	8130	8000	17490
T-14	7870	7800	8470	8530	7330	8178	8508	8240	8040	8349
V-0	8190	8160	8470	9110	7760	8284	8898	8130	8040	9012
V-2	8340	8930	8260	10200	8190	8494	8296	9360	9600	9404
V-4	11800	11200	11570	11700	8410	11127	**	10800	9280	10508

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE CHLORIDE REPORT

CHLORIDES (PPM)

WELL NO.	12-77	1-78	2-78	3-78	4-78	5-78	6-78	7-78	8-78	9-78
L-0	9380	8249	9190	9334	9600	8900	9300	9200	10040	9430
L-2	8020	7746	7760	8487	8330	7900	8800	8200	8550	8340
L-4	8220	7650	8290	8249	8180	8100	8300	8400	8460	8800
L-6	8360	8051	7450	7767	7880	7700	8100	8800	7690	8720
L-8	8390	8309	7850	8738	8660	8000	8300	8900	8480	9150
L-10	7660	7604	7930	8026	8010	7400	7000	8800	7490	7680
L-12	8700	7289	8650	9738	8490	8600	8400	10000	9890	9200
L-14	7820	5977	7380	9029	7800	7200	8600	8600	8320	8240
N-0	8760	9057	9100	9398	8790	8700	8300	10000	8990	9770
N-2	7820	7998	7910	7937	9150	7900	7900	8100	8780	8500
N-4	11880	11979	11850	12858	12070	12700	13700	12700	13670	13220
N-6	10250	9912	9210	9362	9660	9600	10000	11200	10240	10760
N-8	8570	9554	8340	8919	8400	8400	8700	9300	9130	8950
N-10	9480	9050	8680	9455	9810	9400	10100	10500	9560	8920
N-12	8180	7866	7940	7923	3230	8400	8600	7800	8140	8260
N-14	8210	8487	8080	8402	8320	8100	8400	9000	8930	8890
P-0	9950	9873	9840	10401	10220	9900	10100	10700	10210	10490
P-2	8630	5442	9780	11280	8590	8400	9300	8300	9350	9190
P-4	9870	**	9800	10203	8410	10400	10400	8900	10530	10890
P-6	8012	5715	8040	8785	8010	7900	8400	8500	8550	8650
P-8	7810	7533	7810	7983	9590	7800	7700	8200	7720	8340
P-10	9540	9572	9190	9416	9450	9700	10400	10000	10450	**
P-12	7960	6463	7770	7987	5920	7900	8100	9000	8560	8790
P-14	8250	6845	8230	8270	8430	8100	8400	9500	8960	8250
R-0	9840	9749	9630	10692	8770	9700	10400	10900	10770	10920
R-2	8250	7891	11990	8256	11480	8000	8500	8800	8940	**
R-4	12410	10717	12110	13226	12780	12300	13400	12700	11710	14040
R-6	13730	13542	12170	11901	13930	10700	13400	14500	13530	14730
R-8	9760	9593	9306	9072	9470	9300	10100	9700	10170	9590
R-10	10020	13237	9830	10217	10090	9600	10300	**	10770	10340
R-12	**	6452	12540	11684	10930	13100	14300	14100	14000	14440
R-14	12110	12624	12130	11507	13500	12600	12500	14100	12920	12950
T-0	8240	7491	8230	8940	9700	8500	9200	8900	9030	8860
T-2	10430	6129	7920	8714	8160	7900	8500	8700	8830	8900
T-4	10260	9270	10500	8451	11140	10000	11600	11800	11600	11370
T-6	8440	7852	17370	8614	17090	16800	17200	17500	17060	17470
T-8	8300	7576	8370	8788	8400	7900	8500	9400	9290	9180
T-10	8530	6899	8090	9713	8670	8100	8700	9100	9010	8340
T-12	7820	7678	7710	7940	8100	7600	7900	8900	8000	8450
T-14	9630	6661	7890	8855	7490	8000	7700	8500	8600	8360
V-0	8150	7824	7800	10837	12360	8100	8700	9100	8370	8780
V-2	9570	9444	9060	9805	9270	8000	8900	9300	9100	9860
V-4	9360	9979	9830	**	10530	9300	10300	9900	10070	10530

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE CHLORIDE REPORT

CHLORIDES (PPM)

WELL NO.	10-78	11-78	12-78	1-79	2-79	3-79	4-79	5-79	6-79	7-79
L-0	9720	9380	9380	9050	8890	8830	8820	8640	8570	8295
L-2	8960	8190	8120	7670	8340	8250	8020	8010	7800	7370
L-4	9040	9040	8250	7440	7720	7740	7960	7850	7840	8083
L-6	8140	9350	8930	8660	8300	8680	8560	8150	8350	8068
L-8	9100	9344	8750	8990	9110	6880	8680	8110	8160	7799
L-10	7730	9060	7890	7650	7930	7580	7770	7680	7630	7643
L-12	10160	9730	9940	9170	**	**	8600	8640	8710	8455
L-14	8680	8740	8660	8000	8130	8020	8250	7860	7580	7480
N-0	9180	9170	9500	8350	**	**	8430	8380	8460	8356
N-2	9040	9040	7960	8120	8320	7290	6830	6870	6870	6080
N-4	12796	14050	12510	13620	13980	12290	12290	12380	12260	11699
N-6	10510	**	10200	11940	9140	8920	8870	9130	12350	9217
N-8	8650	9680	9840	9260	8330	8050	8040	7910	7950	7907
N-10	9800	11370	9630	10830	8950	9140	9310	9040	9100	9164
N-12	8820	9340	9610	8300	8130	7900	8280	8300	7920	8015
N-14	8540	8060	9290	8270	8230	8270	8230	8380	8400	8377
P-0	10570	10520	9930	9340	8990	9290	9970	9370	8580	7951
P-2	10500	10400	8860	7890	8240	8090	8820	8760	8520	8604
P-4	10430	11730	11680	10030	9620	9810	9420	9590	**	9618
P-6	8210	8140	8320	7130	7620	7890	7970	7910	7930	7728
P-8	8840	9270	7910	9030	7950	**	7990	8270	7820	7707
P-10	10810	9500	10150	10000	10100	10160	10850	10500	10030	10117
P-12	8600	7950	7910	7550	7540	7650	7480	7440	7370	**
P-14	8460	8880	8890	8680	8570	8390	8060	8040	8360	7785
R-0	11060	11980	11120	9590	8960	9060	9150	9260	8900	9040
R-2	9910	**	8400	7920	8890	8150	8180	7700	8030	7888
R-4	13990	8050	13750	10990	12500	12290	12330	**	11980	12291
R-6	10940	13930	13840	15130	12650	12780	12580	12350	11820	12032
R-8	9670	9810	9280	8710	9840	8880	9110	8830	8780	8912
R-10	10530	10750	11250	9480	10580	10240	10390	10560	10610	10185
R-12	12650	13120	14670	11010	11990	11690	12000	12120	11600	11596
R-14	12870	13880	14390	11820	13000	8750	12840	12880	12610	**
T-0	8800	9160	10420	8710	8780	**	8540	8700	8570	8235
T-2	8940	10430	9520	9650	8390	**	8160	8580	8470	8366
T-4	12790	12270	**	12820	10470	10890	11560	11650	11620	11776
T-6	17120	17140	17360	16630	17230	16060	16900	16820	16110	**
T-8	8840	9930	8810	7890	8320	8700	8260	8640	8560	8327
T-10	8360	8530	9620	8192	8010	8100	7990	8190	8150	8051
T-12	8000	8000	8750	6850	7590	7110	7290	7410	7470	7342
T-14	9710	9470	9120	9000	8910	7850	7870	7980	7800	7707
V-0	8610	9450	8970	7830	7630	7680	7890	7940	9320	7739
V-2	10600	10840	9780	9050	8830	9530	9710	9900	10040	10036
V-4	11370	11330	10040	11030	11170	10030	10470	10590	11100	11227

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE CHLORIDE REPORT

WELL ID	8-79	9-79	10-79	11-79	12-79	1-80	2-80	3-80	4-80	5-80	6-80	7-80
J-12	10181	10280	9621	10390	10171	10731	10400	9900	9980	9980C	10014	7111
J-14	8083	8050	7228	7050	8001	10000	8050	7660	7350	5310	7661	6732
L-0	8551	8390	7671	8140	7831	7445	8040	7960	8000	7510	6338	5119
L-2	7214	7150	6867	6300	6253	6200	5580	5580C	4790	4520	5700	7753
L-4	6714	7740	7912	8000	7845	7927	7890	8040	8110	8480	7840	5229
L-6	7608	7400	6934	6460	7891	7891C	7740	5950	5360	4660	5676	7367
L-8	7799C	7670	8111	8100	8136	8037	7920	7890	7980	7560	7767	7367
L-10	7849	7740	7849	7930	7916	7813	8640	7220	7000	6810	6870	6675
L-12	9026	8130	7434	7830	6693	7395	7410	7140	7030	7350	6800	3790
L-14	7512	6670	5839	5410	4949	4878	5770	4450	4840	4250	4165	8246
N-0	8458	8390	8164	8160	7473	8636	8150	8960	8710	8980	9040	4158
N-2	5959	5910	5466	5040	4796	5328	4340	5180	3960	3950	4378	7175
N-4	10869	10780	10047	8720	9805	9827	9130	8900	8620	8050	7065	6370
N-6	9252	9110	8795	8750	7951	8639	8260	8220	8000	7550	7193	4878
N-8	8306	7540	7973	7170	6757	6452	6860	5900	5640	5290	5445	7228
N-10	8738	8690	9174	8500	8504	8444	8360	7870	7930	7760	7569	6783
N-12	8476	13680	8171	8150	7898	8377	8150	8150C	7780	7550	7179	6455
N-14	8214	8930	8728	8520	8182	8926	7500	7150	7700	7540	6540	8189
P-0	8458	8720	8526	8630	8200	8473	8490	8620	8840	8500	8462	8092
P-2	11089	8550	8650	8930	8607	8965	10500	7680	8860	9210	8519	10125
P-4	9600	10150	9784	10450	11117	4951	10780	7950	11100	11270	10865	7296
P-6	7795	8640	8490	8350	7409	7976	8330	7820	8190	7680	7218	8281
P-8	7749	7780	8214	7720	7671	7540	8040	7750	7860	8680	7966	8100
P-10	10319	10250	10250C	10550	11340	11340C	10260	7430	7740	8050	8189	6127
P-12	7370C	7350	7175	7620	7620C	7037	8700	6710	6690	6450	6409	5452
P-14	8458	8300	7437	8290	7852	7767	6910	7470	7130	7050	7303	5378
R-0	9011	8640	8444	8560	8940	9199	7620	6070	6150	8550	5750	6540
R-2	7608	7870	7207	7520	10975	7342	7270	6960	6950	7070	5652	12255
R-4	12581	12370	12436	13300	11546	11812	12620	12970	13240	13340	6572	9203
R-6	12361	11690	9735	11160	10639	11153	11270	10900	10770	11160	9203	7086
R-8	9196	9000	9000C	9130	8604	8380	8240	8170	8200	7740	7473	7189
R-10	9922	9920	8948	9110	9252	9355	8680	7900	7600	7970	6750	9040
R-12	11794	10470	10809	10850	11167	11195	11160	9900	10040	9480	9040	8061
R-14	12386	10970	10288	10070	10070C	7909	9290	9290C	9210	8930	8916	8125
T-0	8795	8670	8522	8660	8458	8919	8340	8860	8460	9000	8554	8721
T-2	8554	9040	8738	8760	8707	8926	8620	8420	9110	9080	9146	9582
T-4	10525	11320	10901	10230	10975	11262	10970	10940	11250	10160	10309	12860
T-6	15020	14670	14903	14410	14003	13875	13860	13960	13230	12570	12865	6916
T-8	14946	8210	8097	7930	7675	7335	7540	6970	6730	7390	8072	6891
T-10	8051C	8290	8168	7780	8005	8469	7940	7750	6610	7170	7508	5732
T-12	7498	8200	6796	6280	8221	6877	6800	6790	6650	6530	6172	6292

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE CHLORIDE REPORT

WELL ID	8-80	9-80
J-12	6431	9270
J-14	7437	6700
L-0	6416	5917
L-2	5626	5009
L-4	7232	7225
L-6	4850	4516
L-8	7111	7164
L-10	6484	5835
L-12	6239	6253
L-14	3903	3580
N-0	8182	6920
N-2	4119	3995
N-4	7363	6658
N-6	8214	5849
N-8	5325	3797
N-10	7235	6246
N-12	7522	6126
N-14	6877	6328
P-0	10018	8019
P-2	8377	8416
P-4	10125	10514
P-6	8210	7675
P-8	8231	7296
P-10	8763	8441
P-12	6030	5966
P-14	7647	6399
R-0	5743	7023
R-2	6852	6321
R-4	12952	12340
R-6	11642	10564
R-8	6693	6452
R-10	7707	7203
R-12	8398	8657
R-14	8061	8040
T-0	8742	8341
T-2	9674	10025
T-4	9582	10305
T-6	13085	13085C
T-8	6916	5098
T-10	6774	6555
T-12	5750	5512

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE CHLORIDE REPORT

CHLORIDES (PPM)

WELL NO.	2-77	3-77	4-77	5-77	6-77	7-77	8-77	9-77	10-77	11-77
V-6	14170	**	13880	12400	8690	14953	**	13570	9390	13429
V-8	8230	8680	8580	9300	8050	8529	9395	8420	9320	8513
V-10	8560	8970	9010	9180	8120	8775	9005	9210	8570	8870
V-12	9650	9660	9880	10900	8840	9442	9714	9390	9430	9582
V-14	10780	11100	11000	12000	9950	10951	10671	10900	10710	11256

** DATA NOT AVAILABLE

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE CHLORIDE REPORT

CHLORIDES (PPM)

WELL NO.	12-77	1-78	2-78	3-78	4-78	5-78	6-78	7-78	8-78	9-78
V-6	9890	12489	12220	14017	15190	13800	13800	13900	13460	14590
V-8	8000	6938	4860	8012	8200	7900	8000	8900	8340	8480
V-10	8610	6969	8610	8976	9350	8600	9300	9700	8880	9170
V-12	8800	7803	8940	12489	9900	9100	9600	9500	8990	10160
V-14	10690	10642	10160	9029	10810	10500	11000	11400	10550	11200

** DATA NOT AVAILABLE

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE CHLORIDE REPORT

CHLORIDES (PPM)

WELL NO.	10-78	11-78	12-78	1-79	2-79	3-79	4-79	5-79	6-79	7-79
V-6	13780	15470	13600	14830	13870	13790	13740	13040	13050	12606
V-8	7930	8550	8520	7520	7290	7710	7870	7880	7950	7629
V-10	9010	9010	**	8830	8420	8430	8910	8840	8780	9033
V-12	8530	**	9260	9330	8880	8860	9090	9080	9220	8962
V-14	11520	11970	11430	8650	10060	10020	10100	9790	9050	10149

** DATA NOT AVAILABLE

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE CHLORIDE REPORT

WELL ID	8-79	9-79	10-79	11-79	12-79	1-80	2-80	3-80	4-80	5-80	6-80	7-80
T-14	7615	7640	7554	7554C	4392	7686	6740	6740C	7430	7430C	6884	7094
V-0	7618	7770	8104	7560	7512	7381	7140	7240	8020	7080	7182	8001
V-2	10036C	9540	10256	7910	10234	10305	9670	8820	8680	8650	7530	10826
V-4	10990	11400	10982	9930	11443	11603	11830	11990	12370	11690	11440	10397
V-6	12606C	12100	12485	10420	10420C	11858	11710	11390	10350	10330	10213	8001
V-8	7870	8390	8575	9100	8682	8455	8940	8760	8920	8360	8997	7200
V-10	9033C	8640	8490	8280	8288	7966	7580	7650	7790	7770	7597	5988
V-12	8650	8700	8717	8500	8026	8026C	7500	6680	7360	7220	7111	6849
V-14	10149C	10310	9703	9440	9132	8944	10500	8320	7920	7830	7420	11748

C DATA CARRIED OVER FROM LAST MONTH.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE CHLORIDE REPORT

WELL ID	8-80	9-80
T-14	6548	5952
V-0	7491	5530
V-2	7420	7182
V-4	10493	11058
V-6	10511	10054
V-8	8256	7969
V-10	7069	7370
V-12	6083	5980
V-14	9472	6544

C DATA CARRIED OVER FROM LAST MONTH.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE CHLORIDE REPORT

CHLORIDES (PPM)

WELL NO.	2-77	3-77	4-77	5-77	6-77	7-77	8-77	9-77	10-77	11-77
AS-35	**	**	**	**	**	**	**	**	12730	0
AS-36	**	**	**	**	**	**	**	8670	8540	0
DD-10	12240	12300	9010	9980	8440	9056	9714	9360	9070	9760
DD-12	8310	8730	8830	9690	8190	9021	9714	9210	9250	9725
DD-14	9870	9840	**	11600	9520	9231	11415	10400	9070	10758
DD-16	10130	10200	10420	10900	9700	10600	10919	10330	10280	11612
DD-18	13000	13100	12980	10900	10200	10741	10919	10760	10740	10900
FF-12	8330	8280	8650	9290	7470	8108	8366	8170	8360	8335
FF-14	8600	8570	8830	9150	7650	4142	7303	9180	8680	9155
FF-16	12460	12700	12830	10700	9880	10635	11947	11340	11380	11612
FF-18	12890	12900	12800	10900	9700	11267	11132	11630	11080	11434
FF-20	**	**	**	19900	**	10846	26377	9770	15290	10900
HH-12	8700	8600	8700	9400	8840	8915	9572	8640	8860	8763
HH-14	8560	8390	8470	8710	8120	8424	9678	8530	8430	8727
HH-16	12640	13100	12730	14000	12860	12145	12266	11880	11700	11897
HH-18	9140	9290	9410	10000	9130	9863	11699	10110	11200	9974
HH-20	9470	**	29920	**	28530	29275	28362	9790	14940	10579
JJ-12	8520	8640	9630	10200	8590	9407	9714	9140	9070	8941
JJ-14	9400	9260	11250	9470	8690	9126	9430	9290	11450	9475
JJ-16	11110	11800	11570	12300	10310	11794	11451	12310	11950	12432
LL-12	8740	8750	8830	9800	7720	8705	7303	**	8710	8976
LL-14	11730	11700	11610	12500	11530	12355	10848	12270	12310	12717
NN-12	10630	10500	10270	11300	9410	10249	11132	11550	10140	10544
NN-14	13440	13200	13520	13600	13510	14181	14216	14220	13870	14783
PP-12	9650	11100	**	10500	9490	9582	10848	9570	9250	9582
PP-14	8920	9080	**	8700	8980	8915	9607	9210	9070	9511
PP-16	10890	9620	**	12000	11860	11373	8366	11770	11560	12325
RR-2	11470	11500	11570	11600	11140	11092	11380	11450	11100	11399
RR-4	15330	**	11540	**	0	21201	10210	20570	11200	20625
RR-6	15300	**	11570	15000	14910	15269	7338	14870	14940	9261
RR-8	9320	9180	9590	10090	8910	9021	10884	8710	23190	8727
RR-10	8190	9220	8830	8780	8480	8178	8189	**	8360	7979
RR-12	8740	8750	9190	9840	8770	9021	7338	8780	**	0
RR-14	8920	9040	**	25230	24650	11653	23611	9020	22980	9760
TT-2	9470	9800	9880	10310	9740	8073	9962	9900	9430	9404
TT-4	14420	14500	10270	13210	12750	11057	11451	9680	9780	13251
TT-6	9110	9150	9700	10850	10280	9758	**	9790	9600	10045
TT-8	8810	8930	9230	9870	9160	9231	10175	9390	22760	9475
TT-10	16830	**	16800	9470	17390	8143	9040	16130	22910	9938
SC-14	**	**	**	9290	**	9126	9785	10260	9530	9333
BP-18	**	**	**	**	**	**	**	**	**	**

** DATA NOT AVAILABLE

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE CHLORIDE REPORT

CHLORIDES (PPM)

WELL NO.	12-77	1-78	2-78	3-78	4-78	5-78	6-78	7-78	8-78	9-78
AS-35	14280	12156	13520	13762	14470	13900	13900	13800	13550	14040
AS-36	8670	8614	6050	8799	9120	8800	8900	8300	8930	9210
DD-10	**	10242	11430	8086	11640	10900	12000	11800	11350	12560
DD-12	9360	9490	9280	9447	10260	9200	9700	9900	9590	9950
DD-14	10120	10529	10190	10227	10180	10200	10400	9100	10300	11390
DD-16	10640	10628	10510	10543	11010	10300	11000	11200	10170	10920
DD-18	10970	7473	10360	10724	10930	10600	10900	10900	10340	11130
FF-12	8180	7214	9360	8217	8125	8000	8200	8400	9480	8720
FF-14	8810	8469	8680	9259	9170	8900	8700	8500	8850	9050
FF-16	11480	9933	11240	8111	11920	11500	12400	11500	11740	13020
FF-18	11230	10032	11030	9869	12060	11200	12200	11000	11270	12420
FF-20	8756	10458	**	26261	29540	26800	**	25600	27540	29580
HH-12	8680	6349	**	8685	9221	8600	8800	9100	8880	9200
HH-14	8230	6002	8170	8756	8990	8400	8700	9200	8580	9020
HH-16	11600	10851	11230	12291	11360	10900	11700	12800	11460	11250
HH-18	9810	10249	11210	**	9970	9500	9100	9000	8930	9200
HH-20	8470	9043	8300	26981	27630	25500	**	26400	26500	14660
JJ-12	9300	9412	9093	9511	9270	9300	9300	9600	9590	9340
JJ-14	8760	6377	6740	**	10080	8800	9100	10000	8980	10320
JJ-16	12130	9866	12170	13205	13120	12900	13300	12800	13270	13820
LL-12	8620	7586	5920	8728	**	8800	9100	9000	9110	9510
LL-14	12540	11993	11990	12149	13330	12100	13200	13100	12460	12750
NN-12	11110	10062	9500	9912	10510	9500	9600	10300	9660	10330
NN-14	14510	14889	13570	14024	15180	14300	15500	14700	14960	15240
PP-12	10270	10061	9060	10373	10640	9700	9900	9900	10260	9680
PP-14	9320	9135	8820	9267	9470	9200	10000	9600	9760	10870
PP-16	10730	11362	10620	11567	11170	11300	11600	11600	11930	12050
RR-2	11150	10227	10980	10387	10040	10500	10500	10500	**	10710
RR-4	**	19412	18560	18905	11640	17200	18100	16000	16770	18450
RR-6	14730	15105	14400	15378	20590	15700	16800	15600	15590	15580
RR-8	8070	8827	5090	8721	16340	8600	9300	9200	8500	9210
RR-10	8670	4630	8780	8178	8780	7700	8100	8000	8140	8610
RR-12	9380	8650	21430	9589	8000	9400	9600	9500	9980	10230
RR-14	9054	11426	9710	9614	9500	11200	20500	13400	**	22930
TT-2	9810	8703	11340	9958	22220	9700	10300	10200	9960	9860
TT-4	12770	12344	8500	11546	10040	11500	12100	11900	11720	**
TT-6	9940	9125	8590	11411	12480	10700	11200	10900	9930	10500
TT-8	9460	7235	21560	10472	11580	8900	9200	14100	9170	9430
TT-10	10610	6711	9070	15286	9490	13500	**	14000	13900	13190
SC-14	9040	9284	8910	**	14860	9300	9800	**	**	10580
BP-18	**	**	**	**	**	**	**	**	**	**

** DATA NOT AVAILABLE

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE CHLORIDE REPORT

CHLORIDES (PPM)

WELL NO.	10-78	11-78	12-78	1-79	2-79	3-79	4-79	5-79	6-79	7-79
AS-35	14660	14620	13080	14720	12880	**	8970	8960	12810	12468
AS-36	9170	9040	9150	8990	9260	**	13060	**	9160	9054
DD-10	10930	11380	11230	10720	11870	10170	10180	10130	10810	10032
DD-12	9800	9660	9390	9760	8960	9250	9420	9530	9700	9309
DD-14	10730	11870	10850	9410	10370	10320	10490	10460	10580	10465
DD-16	12920	10730	10680	11790	**	10110	9340	10850	10360	10256
DD-18	10450	10120	10680	9540	9290	9670	9830	**	9590	9944
FF-12	8090	8360	8450	7100	8080	8320	8180	8690	8440	8370
FF-14	9510	8610	9400	9590	9230	**	9260	9080	9470	8831
FF-16	11360	11360	12830	11730	11530	11750	11140	11630	11730	11996
FF-18	11050	11570	11250	11430	**	10760	10740	10970	11110	11124
FF-20	27420	27310	26990	**	**	**	26870	**	**	**
HH-12	8330	8600	9220	8610	8230	8830	9200	8800	9010	9100
HH-14	8650	9660	9170	8460	8330	8800	8740	8820	8950	8728
HH-16	9180	11330	10180	10010	11600	10630	10950	11060	11420	10380
HH-18	**	**	9010	9050	8370	**	8650	8770	8920	**
HH-20	25900	25650	**	25740	25600	26560	25080	**	**	**
JJ-12	9710	8950	**	11240	9820	7940	8460	8580	8010	8086
JJ-14	9570	9580	9040	9290	8900	9100	11570	9440	10290	9334
JJ-16	13490	13230	13700	13290	**	14370	13620	13340	13600	13861
LL-12	9320	9090	8870	8670	8380	8640	8780	8660	9340	8930
LL-14	11600	12350	9660	11880	12040	11310	11060	11510	11360	11301
NN-12	10440	9570	9650	8670	**	**	8520	8410	8160	8554
NN-14	14810	14660	11500	13450	14070	**	13600	13890	13800	13584
PP-12	9770	9410	9280	9760	**	8470	8510	8180	8200	7994
PP-14	10900	11070	9410	9514	9470	9240	9480	9470	9490	9380
PP-16	12800	11290	10700	10250	10000	10360	10830	10710	10870	9954
RR-2	11270	10340	10040	10330	**	10480	10400	10920	10610	10475
RR-4	18130	18190	18020	17830	**	17570	16900	17083	17570	16488
RR-6	16300	16100	16070	16240	14750	14960	14850	14610	14420	14765
RR-8	8880	8810	8560	8580	**	8670	8600	8820	8830	8703
RR-10	8780	**	8530	7780	8220	8110	7930	7960	8240	8345
RR-12	10440	9370	8880	9080	9110	9090	9390	9420	9580	9398
RR-14	24740	23490	23080	22810	21380	**	21670	**	21840	20366
TT-2	11330	10340	10020	10210	9380	9870	9750	9950	10260	10529
TT-4	12670	11730	11780	10220	9880	10160	11040	11260	11040	11344
TT-6	10870	11090	10840	10210	10540	10760	10250	10420	10110	10603
TT-8	9140	9650	9310	9340	9080	9280	9110	9220	9530	11791
TT-10	13120	12900	12760	12750	12210	**	12160	12450	12140	13046
SC-14	10720	10170	9930	9510	10000	**	**	9670	**	**
BP-18	**	**	**	**	**	**	**	**	**	**

** DATA NOT AVAILABLE

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE CHLORIDE REPORT

WELL ID	8-79	9-79	10-79	11-79	12-79	1-80	2-80	3-80	4-80	5-80	6-80	7-80
AS-35	11947	12660	11043	12910	12468	12156	12960	9270	12070	11870	11978	11748
AS-36	8922	9180	8636	9560	9582	9338	9480	9530	9440	12250	9277	9086
DD-10	11050	10290	10043	10170	10156	10242	10520	10540	10280	10520	9313	10288
DD-12	9501	9620	7328	9530	9678	9465	9840	9660	10360	9590	10351	9146
DD-14	10436	11340	10390	10380	10213	10490	10410	10390	10140	10610	10078	10075
DD-16	10213	10330	10585	10350	10142	10390	10240	10320	10200	10270	11787	9635
DD-18	10057	10130	10532	11510	10337	10809	10740	10960	11320	11060	9936	7778
FF-12	8409	8490	8519	8620	8405	8707	8710	8700	8610	8450	8731	8267
FF-14	8785	8860	8632	8890	9157	8898	8300	8220	8560	8480	8132	7774
FF-16	11621	11520	10483	12300	11745	12250	12250C	11840	11880	12230	11528	11082
FF-18	12464	11430	11348	11680	11489	11801	11850	12090	11510	11480	10840	10436
FF-20	26870C	26870C	11142	11370	11370C	11370C	11970	11970C	15270	29220	9550	9550C
HH-12	8905	8930	8668	9090	9196	8625	8810	8780	8770	8540	7429	8455
HH-14	8806	8810	8699	9290	8891	8884	8720	8860	9160	8770	8838	8561
HH-16	10486	11490	10426	11650	11294	11450	12020	12130	12100	12610	12117	11819
HH-18	8299	9460	8845	9380	9157	8919	9030	9250	9180	9020	8933	8281
HH-20	425	425	10876	10840	15176	23907	12130	12130C	15460	21540	11145	13194
JJ-12	8104	7620	7604	9960	7774	8419	8120	8090	7800	7950	8097	8015
JJ-14	9387	9270	9430	9630	9820	9713	9640	9820	9670	9670C	9959	9444
JJ-16	12645	12420	12294	13000	12305	12411	12560	12120	12680	12940	12659	12379
LL-12	9360	8740	7491	8670	8852	9072	8590	8850	8490	8410	8473	5892
LL-14	10862	10980	11153	11800	11192	11018	11290	11290C	11490	11870	11376	10585
NN-12	7845	7900	7611	8010	7764	7966	8330	7960	8160	8130	7951	7951C
NN-14	14340	13810	13776	14780	13670	13797	8910	13910	14080	14350	13829	13808
PP-12	8281	7740	7554	7850	7976	7654	7170	7580	7150	7260	7012	6849
PP-14	9586	9060	9157	9550	9015	9377	8970	9550	9420	8840	8636	8033
PP-16	10472	10340	9720	10760	10518	10451	10710	9370	11020	10500	10688	8877
RR-2	10291	10290	10284	10630	10358	11174	10580	11010	10770	11310	15857	10628
RR-4	17654	16980	16920	16630	16016	17090	15950	16400	16640	16180	11482	14460
RR-6	13428	13110	12656	12690	12606	12521	11790	12430	11880	12590	8423	11014
RR-8	8625	8710	8501	8960	9022	8852	8600	8840	8560	8550	7583	8455
RR-10	7732	8100	7888	8100	7983	8763	9620	7810	7790	8070	9182	7494
RR-12	9341	9710	9401	9680	9327	9625	9390	9620	9650	9650C	19600	9146
RR-14	19388	20970	20806	20806C	20806	21121	20500	20830	21390	20940	10259	10259C
TT-2	10465	10790	10426	10070	9937	10270	10330	10390	9960	10210	10741	9603
TT-4	10490	10600	10525	9950	10546	9706	10270	11310	10970	10860	10536	11312
TT-6	9894	10660	10472	10460	10358	10497	10180	10500	10670	10490	9536	10220
TT-8	9320	9560	9320	9580	9657	9706	8440	9780	8690	9920	12237	9759
TT-10	12181	12050	10316	11940	12053	12177	11920	12020	12080	9890	9890	12096
SC-14	9670C	9670C	9670C	9670C	9618	9618C	10100	9890	9890C	12940	11135	11135C
BP-18	9890C	9890C	9890C	14060	10447	13074	13074C	10040	10040C	12940	9000	9000C

C DATA CARRIED OVER FROM LAST MONTH.

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
'5.0-ACRE CHLORIDE REPORT

WELL ID	8-80	9-80
AS-35	11298	11603
AS-36	9504	9146
DD-10	10103	9756
DD-12	9625	9522
DD-14	10047	9766
DD-16	9844	9525
DD-18	9947	10227
FF-12	8551	8288
FF-14	8072	8022
FF-16	10858	10851
FF-18	8717	10142
FF-20	27410	27410C
HH-12	7388	8246
HH-14	8100	8111
HH-16	12978	11525
HH-18	8965	8341
HH-20	27162	27162C
JJ-12	8175	7239
JJ-14	10121	10121C
JJ-16	12344	12344C
LL-12	8657	8037
LL-14	12018	12018C
NN-12	8029	7615
NN-14	14524	13609
PP-12	6544	6913
PP-14	8816	8515
PP-16	11092	9965
RR-2	12298	10876
RR-4	15396	14460
RR-6	12638	12081
RR-8	8458	8214
RR-10	7292	7367
RR-12	9334	8767
RR-14	19678	18962
TT-2	9951	10203
TT-4	11340	11858
TT-6	10351	10238
TT-8	9628	9738
TT-10	12315	12953
SC-14	9890	9890C
BP-18	0	0C

C DATA CARRIED OVER FROM LAST MONTH.

MARATHON OIL COMPANY
MARAFLOOD PROCESS M-1 PROJECT
TRITIATED WATER REPORT

WELL NO.	6-77	7-77	8-77	9-77	10-77	11-77	12-77	1-78	2-78	3-78	4-78	5-78	6-78	7-78
B-4	**	**	**	**	**	350	**	**	**	**	**	**	**	**
D-4	1703	1336	970	**	290	347	431	447	**	**	**	401	**	460
H-8	**	**	**	**	**	**	**	**	125	138	**	**	**	**
J-8	**	**	**	**	**	**	**	**	123	136	181	130	252	220
L-4	47	**	**	**	**	**	**	232	**	**	355	**	**	**
L-6	**	205	196	204	219	210	337	290	**	372	351	338	**	300
L-12	**	**	**	**	190	411	526	676	922	957	1112	806	809	790
N-8	**	**	**	**	**	**	**	**	**	**	134	**	**	**
RR-2	**	**	**	**	**	188	304	**	463	454	698	849	947	990
TT-2	**	**	**	165	165	**	**	**	**	**	**	**	**	**
TT-4	**	**	**	168	168	203	253	211	**	**	**	156	155	160
TT-10	**	**	**	**	**	251	**	**	**	**	**	**	**	**
XA-12	**	**	**	**	2020	**	**	3670	**	**	**	**	**	**
XA-14	**	**	426	1182	2127	2745	3538	3662	3721	3791	**	4196	3819	3700
ECB-5	**	**	**	**	**	**	**	248	**	**	**	**	**	**
N-6	**	**	**	**	**	**	**	**	**	**	**	147	204	280
J-6	**	**	**	**	**	**	**	**	**	**	**	**	168	150
PP-12	**	**	**	**	**	**	**	**	**	**	**	**	171	190

(DATA REPORTED AS DPM/ML--DISINTEGRATIONS PER MINUTE/MILLILITER OF TEST FLUID)
** BELOW BACKGROUND LEVEL

MARATHON OIL COMPANY
MARAFLOOD PROCESS M-1 PROJECT
TRITIATED WATER REPORT

WELL NO.	8-78	9-78	10-78	11-78	12-78	1-79	2-79	3-79	4-79	5-79	6-79	7-79
XA-10	**	**	**	**	**	**	**	**	146	**	**	**
XA-12	**	**	**	**	**	**	**	**	**	**	**	**
XA-14	3689	4161	4146	4095	4112	3849	4872	4379	4057	4638	**	5000
AA-11	**	**	**	**	**	**	**	**	316	**	**	445
B-4	489	**	**	**	**	**	**	**	**	**	858	201
D-4	**	475	**	560	**	431	484	484	269	**	385	351
D-10	**	**	511	**	**	**	**	**	**	**	**	**
ECB-5	**	**	**	**	**	**	**	**	**	**	**	**
F-4	**	**	**	**	**	**	**	**	**	**	**	201
H-8	**	**	**	**	**	**	**	**	**	**	**	**
J-0	**	**	**	**	214	**	**	**	**	**	**	**
J-4	**	**	**	**	212	**	**	**	**	**	**	**
J-6	174	171	150	204	207	474	**	338	281	172	206	226
J-8	231	212	223	231	324	**	384	**	**	**	197	262
L-4	**	**	**	**	**	**	**	**	**	**	**	**
L-6	326	316	326	315	341	404	143	**	131	**	187	241
L-12	838	1010	860	971	477	686	**	**	1442	1517	1244	758
L-14	**	**	**	**	**	**	**	**	**	**	1236	**
N-2	**	**	**	**	**	**	**	**	**	**	**	284
N-6	384	478	537	**	569	1048	246	199	146	212	**	1684
N-8	**	**	**	**	**	**	**	**	**	**	**	**
N-10	**	**	**	**	**	**	**	**	**	**	**	**
P-12	**	**	**	**	**	**	213	563	398	884	1003	**
R-14	**	**	**	**	**	**	**	1517	**	**	**	**
T-6	**	**	**	**	**	**	**	315	**	**	**	**
T-8	**	**	**	**	**	**	443	**	225	182	**	226
PP-12	371	905	1445	1137	1081	666	**	671	439	416	430	564
RR-2	**	1197	1165	1069	832	648	**	383	370	340	271	254
TT-2	**	**	**	**	**	**	**	**	**	**	**	**
TT-4	489	**	294	327	415	347	178	300	304	261	192	155
TT-10	**	**	**	**	**	**	**	**	**	**	**	**

(DATA REPORTED AS DPM/ML--DISINTEGRATIONS PER MINUTE/MILLILITER OF TEST FLUID)
** BELOW BACKGROUND LEVEL

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE TRITIATED WATER REPORT

WELL ID	8-79	9-79	10-79	11-79	12-79	1-80	2-80	3-80	4-80	5-80	6-80	7-80
XA-10			3343	1470			553	237	390			
XA-12				805			1079	343	326	937	368	234
XA-14	4250	3400	3459	3175	4350	4340	4249	4593	3426	4340		2097
AA-11				247		260	2474	575	841	443	191	
B-0												
EB-5												
B-4			3673	897			4815		3407			
B-6							77					
B-8								3533		4447	8600	3805
B-10												
B-12							149		180			
B-14												
B-16												
D-0												
D-2												
D-4			220	352				4700	513	1150	1200	238
D-6								189		183	69	203
D-8									498	56		
D-10												
F-0												
F-2												
F-4	201											
F-6									498	56		
F-8												
F-10												
F-12												
F-14												
H-0												
H-2												
H-4												
H-6												
H-8			365				179					
H-10												
H-12												
H-14							8333	420	800	1116	100	
J-0												
J-2												
J-4												
J-6	460	230	222	210			356	436	582	606	295	
J-8	330		405	365	430	388	467	568	490	373	247	369
J-10												

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE TRITIATED WATER REPORT

WELL ID	8-80
XA-10	
XA-12	286
XA-14	3017
AA-11	128
B-0	
EB-5	
B-4	
B-6	
B-8	26300
B-10	
B-12	
B-14	
B-16	
D-0	
D-2	
D-4	684
D-6	216
D-8	
D-10	
F-0	
F-2	
F-4	
F-6	
F-8	
F-10	
F-12	
F-14	
H-0	
H-2	
H-4	
H-6	
H-8	
H-10	
H-12	
H-14	
J-0	
J-2	
J-4	
J-6	281
J-8	355
J-10	

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE TRITIATED WATER REPORT

WELL ID	8-79	9-79	10-79	11-79	12-79	1-80	2-80	3-80	4-80	5-80	6-80	7-80
J-12												
J-14												
L-0												
L-2												
L-4												
L-6	275	255	220				144		100	408	72	159
L-8												
L-10												
L-12	540	355	473	593	230	428	1419	1038	737	805	483	577
L-14							101	116		71		77
N-0												
N-2												
N-4							233	191	73	184		
N-6	2560	2290	2370	2325	2140	1320	1296	1219	1684	1607	975	1107
N-8							220	106	91			
N-10	270											
N-12				210	298	328	319		453	461	354	418
N-14					229	335	386	431	548	585	520	461
P-0												
P-2												
P-4												
P-6												
P-8												
P-10												
P-12		1090	1228	910		852	673	622	677	680	497	522
P-14							392				46	53
R-0												
R-2												
R-4												
R-6												
R-8												
R-10												
R-12												
R-14							115					
T-0												
T-2												
T-4												
T-6							601	256		181	1102	1624
T-8						175	209	276	248	233	198	
T-10												
T-12												

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE TRITIATED WATER REPORT

WELL ID	8-80
J-12	
J-14	
L-0	
L-2	
L-4	
L-6	192
L-8	
L-10	
L-12	587
L-14	78
N-0	
N-2	
N-4	
N-6	910
N-8	
N-10	
N-12	440
N-14	554
P-0	
P-2	
P-4	
P-6	
P-8	
P-10	
P-12	496
P-14	48
R-0	
R-2	
R-4	
R-6	
R-8	
R-10	
R-12	
R-14	
T-0	
T-2	
T-4	
T-6	1071
T-8	233
T-10	
T-12	

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE TRITIATED WATER REPORT

WELL ID	8-79	9-79	10-79	11-79	12-79	1-80	2-80	3-80	4-80	5-80	6-80	7-80
T-14												
V-0							676					
V-2												
V-4												
V-6												
V-8												
V-10												
V-12												
V-14							125					

(DATA REPORTED AS DPM/ML--DISINTEGRATIONS PER MINUTE/MILLIMETER OF TEST FLUID)
** BELOW BACKGROUND LEVEL

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
2.5-ACRE TRITIATED WATER REPORT

WELL ID 8-80

T-14
V-0
V-2
V-4
V-6
V-8
V-10
V-12
V-14

(DATA REPORTED AS DPM/ML--DISINTEGRATIONS PER MINUTE/MILLIMETER OF TEST FLUID)
** BELOW BACKGROUND LEVEL

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE TRITIATED WATER REPORT

WELL ID	8-79	9-79	10-79	11-79	12-79	1-80	2-80	3-80	4-80	5-80	6-80	7-80
AS-35												
AS-36												
DD-10												
DD-12									90			
DD-14												
DD-16												
DD-18												
FF-12												
FF-14							115	93	97	108	94	65
FF-16												
FF-18												
FF-20												
HH-12												
HH-14				170			135	156	166	195	223	159
HH-16												
HH-18												
HH-20												
JJ-12												
JJ-14												
JJ-16												
LL-12												
LL-14												
NN-12												
NN-14												
PP-12	620	1070	1130	924	884		1016		1188	1040	822	639
PP-14							46		61			
PP-16												
RR-2	230	255	246	225	212	170	123	117	111	111		142
RR-4												
RR-6												
RR-8												
RR-10							186					
RR-12						188	186	291	267	325	338	384
RR-14							171	218	189	221		288
TT-2									66	61	131	92
TT-4	180	160		236	193		360	403	529	560	523	
TT-6							74					
TT-8												
TT-10			373									
SC-14												
BP-18												

(DATA REPORTED AS DPM/ML--DISINTEGRATIONS PER MINUTE/MILLIMETER OF TEST FLUID)
** BELOW BACKGROUND LEVEL

☆ U.S. GOVERNMENT PRINTING OFFICE: 1981—771-031/31

MARATHON OIL COMPANY
MARAFLOOD PROCESS - M-1 PROJECT
5.0-ACRE TRITIATED WATER REPORT

WELL ID	8-80
AS-35	
AS-36	
DD-10	
DD-12	
DD-14	
DD-16	
DD-18	
FF-12	
FF-14	103
FF-16	
FF-18	
FF-20	
HH-12	
HH-14	237
HH-16	
HH-18	
HH-20	
JJ-12	
JJ-14	
JJ-16	
LL-12	
LL-14	
NN-12	
NN-14	
PP-12	883
PP-14	
PP-16	
RR-2	115
RR-4	
RR-6	
RR-8	
RR-10	
RR-12	147
RR-14	
TT-2	
TT-4	419
TT-6	
TT-8	
TT-10	
SC-14	
BP-18	

(DATA REPORTED AS DPM/ML--DISINTEGRATIONS PER MINUTE/MILLIMETER OF TEST FLUID)
** BELOW BACKGROUND LEVEL