Manitoba

Energy and Mines Petroleum

555 — 330 Graham Avenue
Winnipeg, Manitoba, CANADA
R3C 4E3

(204) 945-6577

July 24, 1989

Enron Oil Canada Ltd.
1300, 700 - 9th Avenue S.W.
CALGARY, Alberta T2P 3V4

Attention: Mr. T. McKay
Production Engineering

Re: Waskada Unit No. 16 - MPR Exemption

Dear Sir:

Your submission of the results of the 1989 Waskada Unit No. 16 pressure survey is hereby acknowledged. Analysis of the survey results indicates the average reservoir pressure in the expanded unit area is above the minimum pressure to 5 000 kPa. Cumulative voidage replacement since December 1988, when water injection in the expanded unit area commenced, is above 1.0.

Therefore, in accordance with Board Order No. 76A, exemption from maximum permissible rates is extended to all producing wells in Waskada Unit No. 16, effective July 1, 1989.

Yours sincerely,

ORIGINAL SIGNED BY
JOHN N. FOX

John N. Fox
Chief Petroleum Engineer
Petroleum Branch

JNF:dah

ENRON
Oil Canada Ltd.

(403) 298-2600

9 March 1988

Manitoba Energy and Mines
Petroleum Department
#555, 330 Graham Avenue
Winnipeg, Manitoba
R3C 4E3

Attention: Mr. L.R. Dubreuil,
Chief Petroleum Engineer

Dear Sir:

Re: Waskada Unit No. 16 Pressure Survey

Enron Oil Canada Ltd. conducted pressure fall-off tests on the four water injection wells within Waskada Unit No. 16 starting on December 7, 1987. The enclosed pressure fall-off tests analyses show that all four wells have estimated average drainage region pressures exceeding the 5 000 kPa minimum requirement at a datum depth of 440 m subsea.

Monthly Unit progress reports indicate that reservoir withdrawals have been completely replaced by injection water since injection started on June 2, 1987. It is therefore requested that Waskada Unit No. 16 (Order No. PM57) be granted exemption from maximum permissible rates effective March 1, 1988.

Should you wish to discuss any of the above matters, please contact the undersigned at (403)298-2656.

Yours very truly,

ENRON OIL CANADA LTD.

H. Dale Logie

H. Dale Logie,
Chief Reservoir Engineer

HDL:pdc
attach

cc: R.A. Schultz

1300, 700 - 9th Avenue S.W., Calgary, Alberta T2P 3V4

Manitoba

Energy and Mines Petroleum

555 — 330 Graham Avenue
Winnipeg, Manitoba, CANADA
R3C 4E3

(204) 945-6577

October 7, 1987

Omega Hydrocarbons Ltd.
1300, 112 - 4th Avenue S.W.
CALGARY, AB T2P 0H3

Attention: G.E. Patey
Vice-President, Production

Re: Board Order No. 76A
Waskada Unit No. 16 - MPR Exemption

Enclosed for your information is Oil and Natural Gas Conservation Board Order No. 76A regarding exemption from maximum permissible rate restrictions in Waskada Unit No. 16.

Yours sincerely,

L.R. Dubreuil
Chief Petroleum Engineer

LRD:dah

encl

Manitoba

Energy and Mines | Petroleum | 555 — 330 Graham Avenue
Winnipeg, Manitoba, CANADA
R3C 4E3

(204) 945-6577

October 7, 1987

Enron Oil Canada Ltd.
1300, 700 - 9th Avenue S.W.
CALGARY, Alberta T2P 3V4

Attention: Mr. R.A.W. Smith
Senior Reservoir Engineer

RE: Waskada Unit No. 16 - MPR Exemption

Dear Rick:

Enclosed please find Oil and Natural Gas Conservation Order No. 76A respecting exemption from maximum permissible rates in the subject Unit. Please note that the exemption is subject to demonstration that datum depth pressures exceed 5 000 kPa and that voidage is maintained.

The most recent reservoir pressure data that has been submitted indicates a substantial part of the Unit Area is below the minimum required and this is confirmed by recently measured pressure at Enron et al Waskada 9-5-2-25 (WPM). You are therefore required to take additional pressure surveys prior to the Orders becoming effective.

You are also requested to submit the details of the pressure survey at the 9-5 well.

Yours sincerely,

L.R. Dubreuil
Chief Petroleum Engineer

LRD:dah

encl

September 10, 1987

The Oil and Natural Gas
Conservation Board

Charles S. Kang - Chairman
Wm. McDonald - Deputy Chairman
B. Ball - Member

H. Clare Moster
Executive Director
Petroleum Division

Re: Waskada Unit No. 16
Exemption from Maximum Permissible Rates and Overproduction at 9-5-2-25 WPM

BACKGROUND:

Enron Oil Canada Ltd., as operator of Waskada Unit No. 16, made application May 19, 1987 for exemption from maximum permissible rate (MPR) restrictions for wells in the subject Unit (refer to initial memo to Board dated June 2, 1987).

Notice of the application was published in the Manitoba Gazette (June 20, 1987) and in the Deloraine Times and Star (June 24, 1987) and a copy sent to Omega Hydrocarbons Ltd. (the offsetting operator).

In reviewing Enron's initial application, it was evidenced that Enron had one Unit well (9-5-2-25 WPM) in an overproduction situation and this was brought to their attention by letter dated June 2, 1987.

Enron subsequently submitted (July 6, 1987) an amendment to their MPR application requesting waiver of the overproduction on the 9-5 well.

This amendment was brought to Omega's attention by letter dated July 10, 1987.

Omega Hydrocarbons Ltd. submitted a formal intervention dated July 17, 1987 to Enron's application, particularly regarding the waiver of the overproduction on the 9-5 well.

The Board, in its letter of August 7, 1987 forwarded a copy of Omega's intervention to Enron for its comment. In addition, the Board ordered the 9-5 well shut in pursuant to subsection 51(6) of the Regulations.

Enron, in its response to the Board's letter, contends that overproduction from the 9-5 well has had no adverse affect on offsetting production. However, noting that continued shut in of the well will have eliminated overproduction by about September 20, 1987, Enron has withdrawn its amendment (July 6, 1987) to the application.

Recommendation:

It is recommended that the application be approved and that Board Order No. 76A (attached) be approved.

Discussion:

Board Order No. 76A provides for exemption from MPR restrictions for wells in Waskada Unit No. 16, provided reservoir pressures exceed a certain level (5 000 kPa) and provided reservoir voidage continues to be replaced on a cumulative basis from the commencement of water injection.

Figure No. 1 shows recent pressure data obtained in the Unit Area. The data indicates that for a good portion of the Unit (shaded area) it has not been demonstrated that pressures exceed the specified minimum pressure level of 5 000 kPa. Additional pressure surveys will be required prior to MPR exemption being effective.

Table No. 1 provides a summary of injection production and reservoir voidage replacement since commencement of injection in June 1987. The table indicates that voidage has been overreplaced on a cumulative basis since injection commenced. Consequently, if it can be demonstrated that reservoir pressures exceed the required minimum, the exemption from MPR's will be effective.

L. R. Dubreuil

LRD/lk

Recommended for Approval _____
H. Clare Moster

1572P

TABLE NO. 1

Waskada Unit No. 16
Voidage Replacement Summary

	Oil (m^3) at Surface	Oil (m^3) in Reservoir	Water Produced (m^3)	Water Injected (m^3)
June	874.0	1 009.5	276.6	2 743.3
July	935.5	1 080.5	295.5	3 404.0
		2 090.0	572.1	6 147.3

Total Voidage 2 662.0 m^3

Total Voidage Replaced 6 147.3

Percent Voidage Replaced = 6 147.3 ÷ 2 262.0 x 100

= 272%

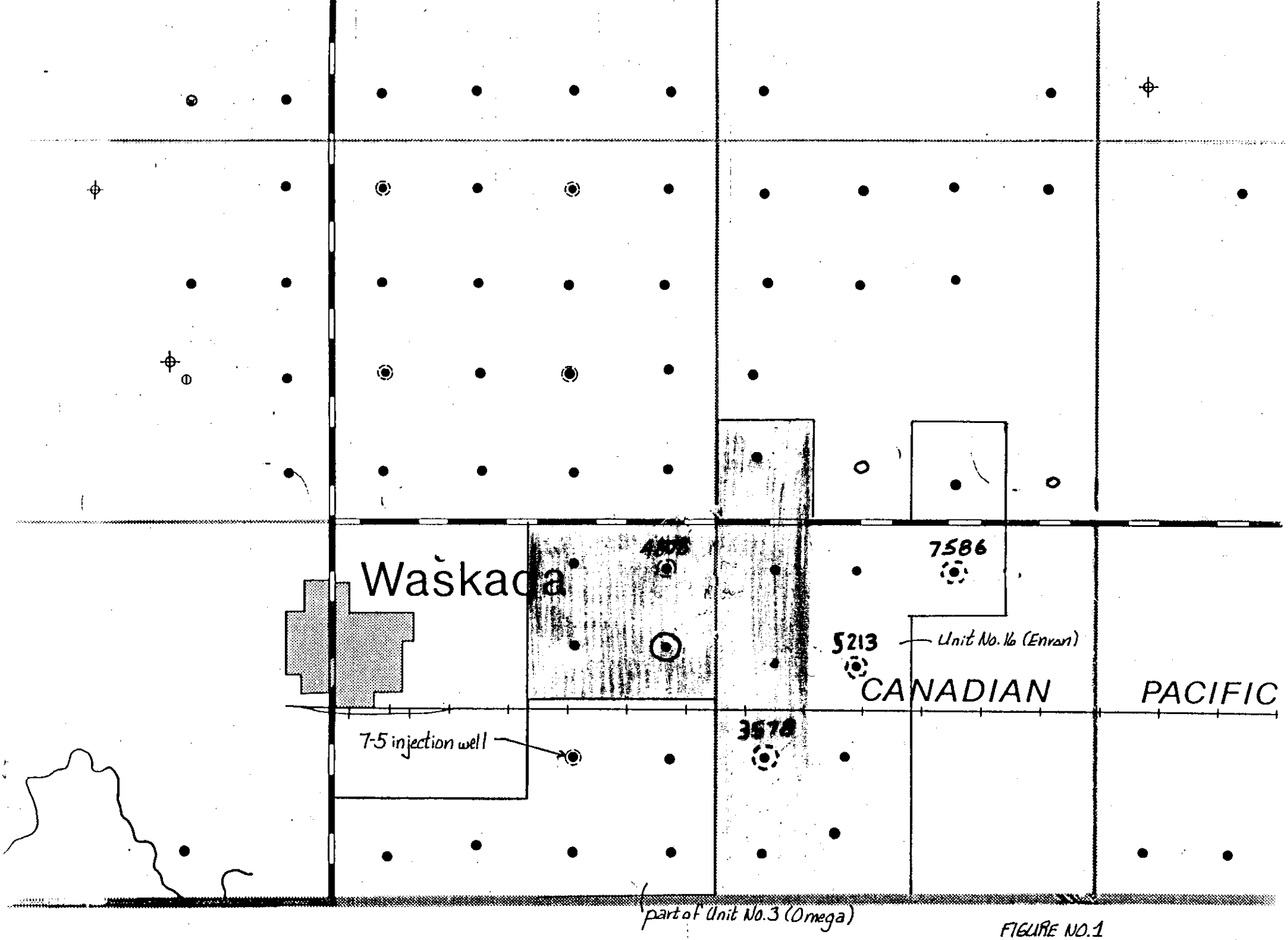


FIGURE NO. 1

FIG NO. 1
PRE INJECTION PRESSURE SURVEY - WASKADA UNIT NO. 16

241

ENRON
Oil Canada Ltd.

(403) 298-2600

2 September 1987

The Oil and Natural Gas Conservation Board
309 Legislative Building
450 Broadway Avenue
Winnipeg, Manitoba
R3C 0V8

Attention: Charles S. Kang,
Chairman

Dear Sir:

Re: Waskada Unit No. 16
Exemption from maximum Permissible Rates

In response to the opportunity to review and comment on the intervention dated July 17, 1987 by Omega Hydrocarbons Ltd., Enron Oil Canada Ltd.'s comments are as follows.

Enron's interpretation is that 8-5 is not adversely affected by the performance of 9-5 and our conclusion is supported by the following:

1) As indicated on Figure No. 1, the decline performance of the 8-5 well has not changed from the beginning of production.

2) When considering the drainage impact of an offset well due to "over-production" from a reservoir standpoint, it is more appropriate to use "cumulative real" over-production rather than "accounting" over-production which neglects under-production. Due to a 4½ month (April through July) voluntary shut in period of Waskada Unit #16 in 1986 for conservation purposes, 9-5 has almost always had a cumulative under-production status. By September 20, 1987, which is the retirement date of the "accounting" over-production, location 9-5 shows a cumulative under-production of -632 m^3. Hence it is not surprising that 8-5 shows no negative performance from offset drainage.

1300, 700 - 9th Avenue S.W., Calgary, Alberta T2P 3V4

3) If there is a permeability trend in the Lower Amaranth, it is most likely in a NE/SW orientation. Hence if any well would have been affected by the over-production of 9-5, it would have been location 7-5. Figure No. 1 demonstrates that location 7-5 has similar performance to 9-5 with a very modest production decline and again no observable production loss.

Enron has included the above response for the sake of completeness but with the retirement date for the over-production of 9-5 less than three weeks away, Enron formally withdraws the application to waive the over-production of location 9-5-2-25 WPM.

Yours very truly,

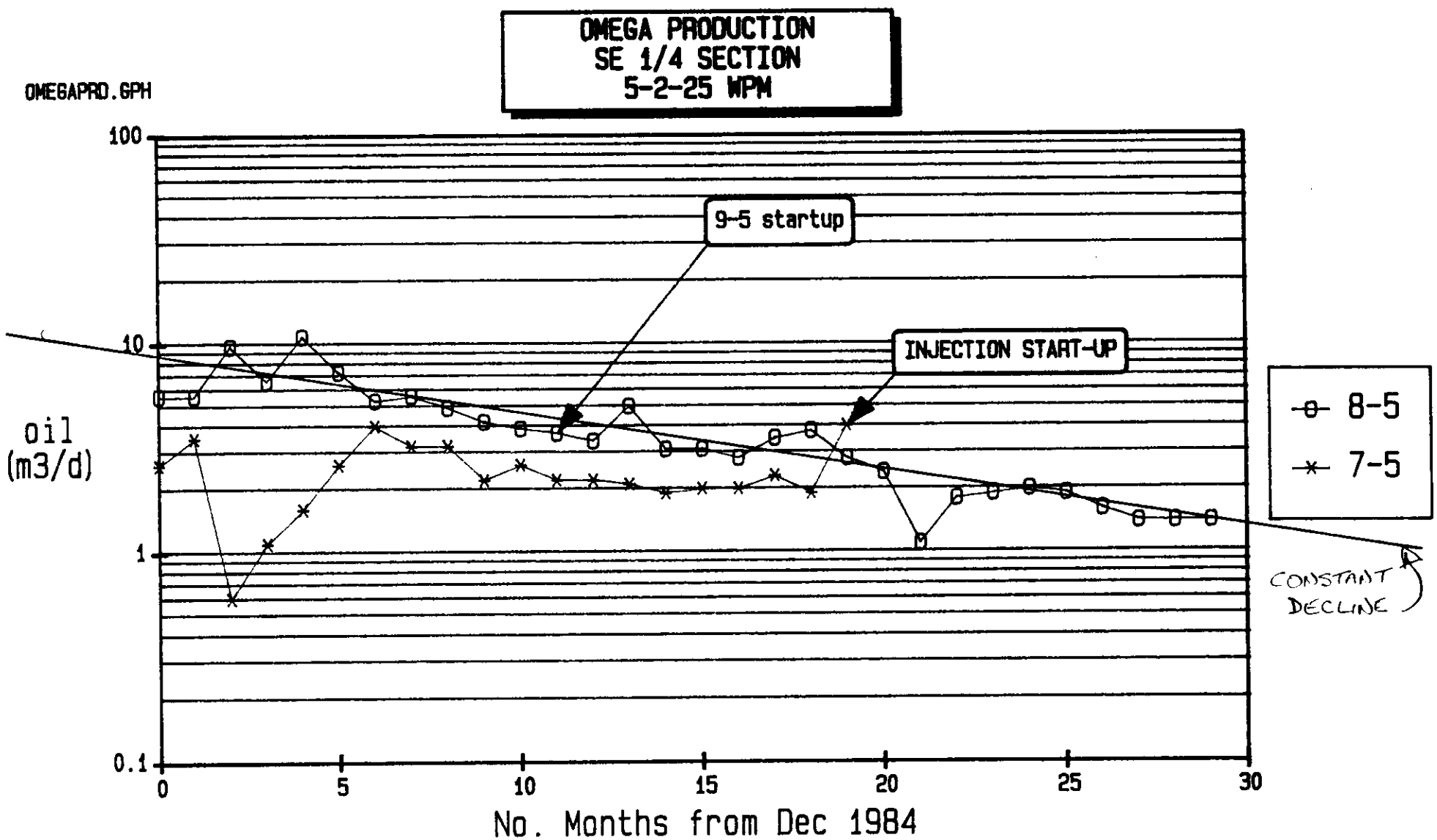
ENRON OIL CANADA LTD.

R.A.W. Smith, P.Eng.
Senior Reservoir Engineer

RAWS:pdc
attach

cc: B. Dubreuil - Petroleum Branch
R.A. Schultz - Enron Oil Canada Ltd.
G.E. Patey - Omega Hydrocarbons Ltd.

FIGURE No. 1


OMEGA PRODUCTION
SE 1/4 SECTION
5-2-25 WPM
OMEGAPRD.GPH
100
10
1
0.1
oil
(m3/d)
9-5 startup
INJECTION START-UP
8-5
7-5
CONSTANT DECLINE
0
5
10
15
20
25
30
No. Months from Dec 1984

AUG 7 1987

Enron Oil Canada Ltd.
1300, 700 - 9th Avenue S.W.
Calgary, Alberta
T2P 3V4

Attention: Mr. R.A.W. Smith, P. Eng.,
Senior Reservoir Engineer

Dear Sirs:

Re: Waskada Unit No. 16
Application for Exemption from MPR Restrictions

Your letter dated July 6, 1987 amending the subject application to request waiver of the accumulated overproduction at the well Enron et al Waskada 9-5-2-25 (WPM) is acknowledged.

Upon receipt of your letter, a copy was sent to Omega Hydrocarbons Ltd., the only potentially affected offset working interest owner. Omega has filed an intervention outlining its concerns with your request. A copy of this intervention is provided for your review and comment. The Board will withhold its decision in this matter until your comments have been received.

With respect to the well Enron et al Waskada 9-5-2-25 (WPM), we note that accumulated overproduction through June 1987 is 349.7 m^3 or in excess of the monthly maximum permissible rate of 240 m^3. Subsection 51(6) requires that a well with accumulated overproduction in excess of its maximum permissible production rate be shut in until the overproduction is reduced to zero or the Board authorizes continued production. Since the Board has not authorized continued production, this well is to be shut in immeditely pending elimination of overproduction and subject to final disposition of your application.

Sincerely yours

ORIGINAL SIGNED BY
CHARLES S. KANG

Charles S. Kang
Chairman

LRD/lk

b.c. Wm. McDonald
B. Ball
Petroleum Division
Waskada Office

AUG 4 1987

Omega Hydrocarbons Ltd.
1300 Sun Life Plaza III
112 - 4th Avenue S.W.
Calgary, Alberta
T2P 0H3

Attention: G. E. Patey,
Vice-President, Production

Dear Sirs:

Re: Waskada Unit No. 16
Exemption from Maximum Permissible Rates

Receipt of your letter dated July 17, 1987 is acknowledged.

You will be notified in due course as to the Board's decision on the subject application.

Sincerely yours

ORIGINAL SIGNED BY
CHARLES S. KANG

Charles S. Kang
Chairman

HCM/lk

b.c. Wm. McDonald
B. Ball
Petroleum

9-5-2-25

Overproduction

Month /yr	Production (m^3)	Allowable prod (m^3)	OP (m^3)	Cumm OP (m^3)
Nov/85	189.1	—	—	—
Dec	267.6	240	27.6	27.6
Jan/86	415.7	240	175.7	203.3
Feb	408.6	240	168.6	371.9
Mar	196.0	240	—	327.9
Apr	—	240	—	87.9
May	—	240	—	0
Jun	—	240	—	0
Jul	—	240	—	0
Aug	354.0	240	114	114
Sep	313.0	240	73	187
Oct	254.3	240	14.3	201.3
Nov	274.8	240	34.8	236.1
Dec	316.2	240	76.2	312.3
Jan/87	293.1	240	53.1	365.4
Feb/87	268.3	240	28.1	293.5
Mar/87	290.7	240	50.7	444.2
Apr/87	292.3	240	52.3	496.5
May/87	220.5	240	—	477.0
June/87	112.7	240	—	349.7
July/87	190.9	240	—	300.6
Aug 87				
Sept 87				

FIGURE NO.2

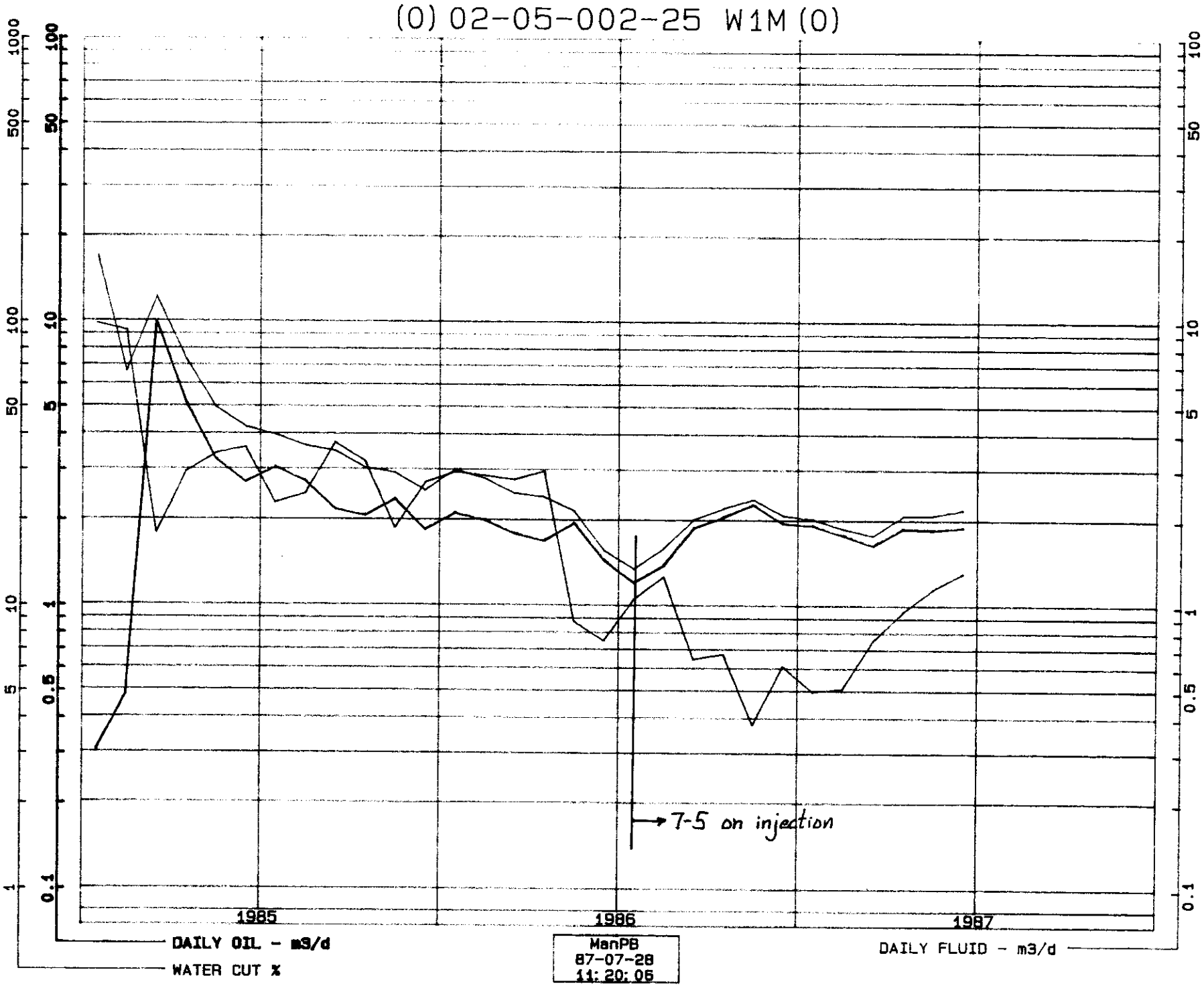

(0) 02-05-002-25 W1M (0)
1000
500
100
50
10
5
1
100
50
10
5
1
0.5
0.1
100
50
10
5
1
0.5
0.1
1985
1986
1987
7-5 on injection
DAILY OIL - m3/d
WATER CUT %
DAILY FLUID - m3/d
ManPB
87-07-28
11:20:06

FIGURE NO.3

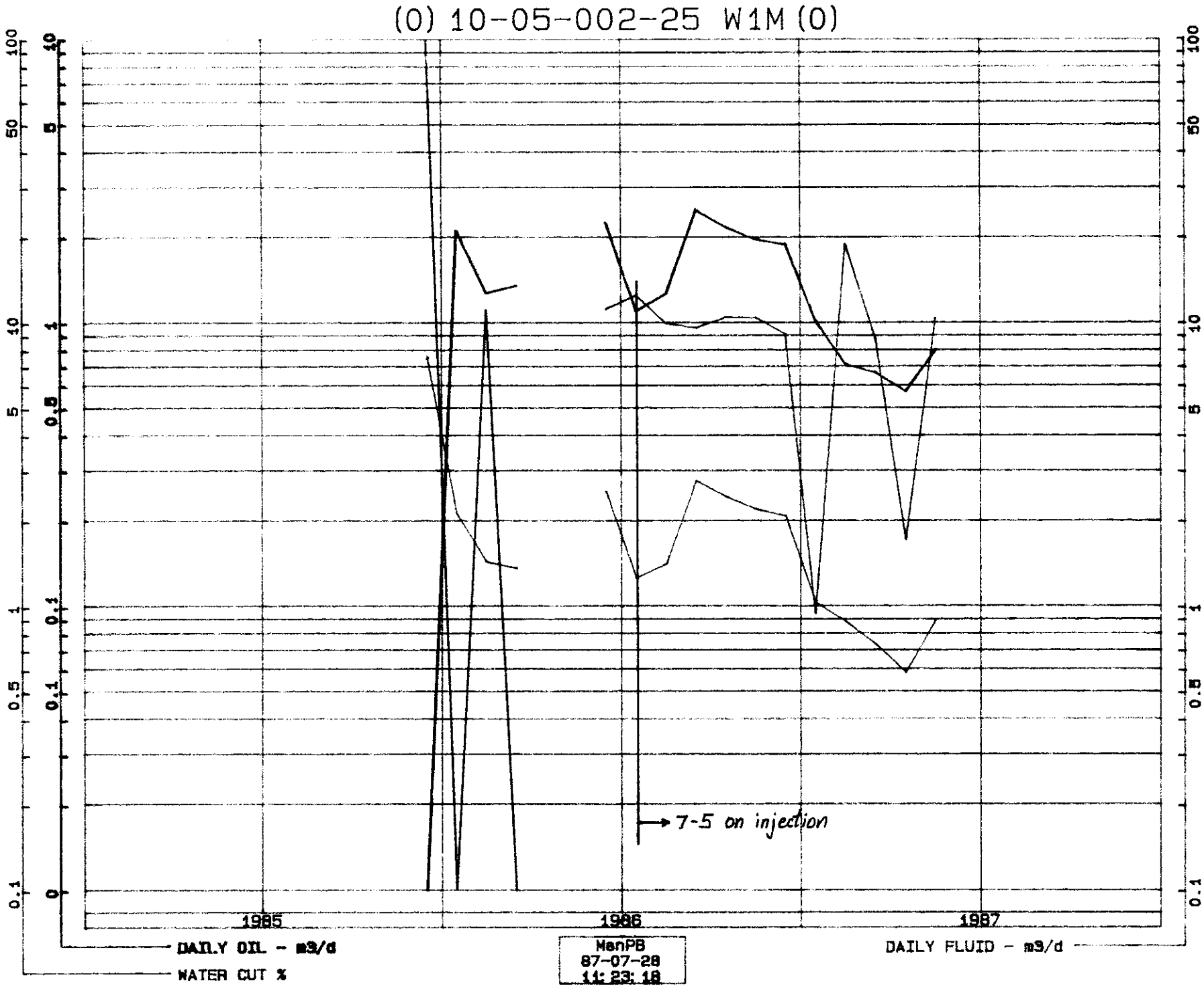

(0) 10-05-002-25 W1M (0)
100
50
10
5
1
0.5
0.1
10
5
1
0.5
0.1
0
1985
1986
1987
7-5 on injection
DAILY OIL - m3/d
WATER CUT %
DAILY FLUID - m3/d
ManPB
87-07-28
11:23:18

FIGURE NO. 4

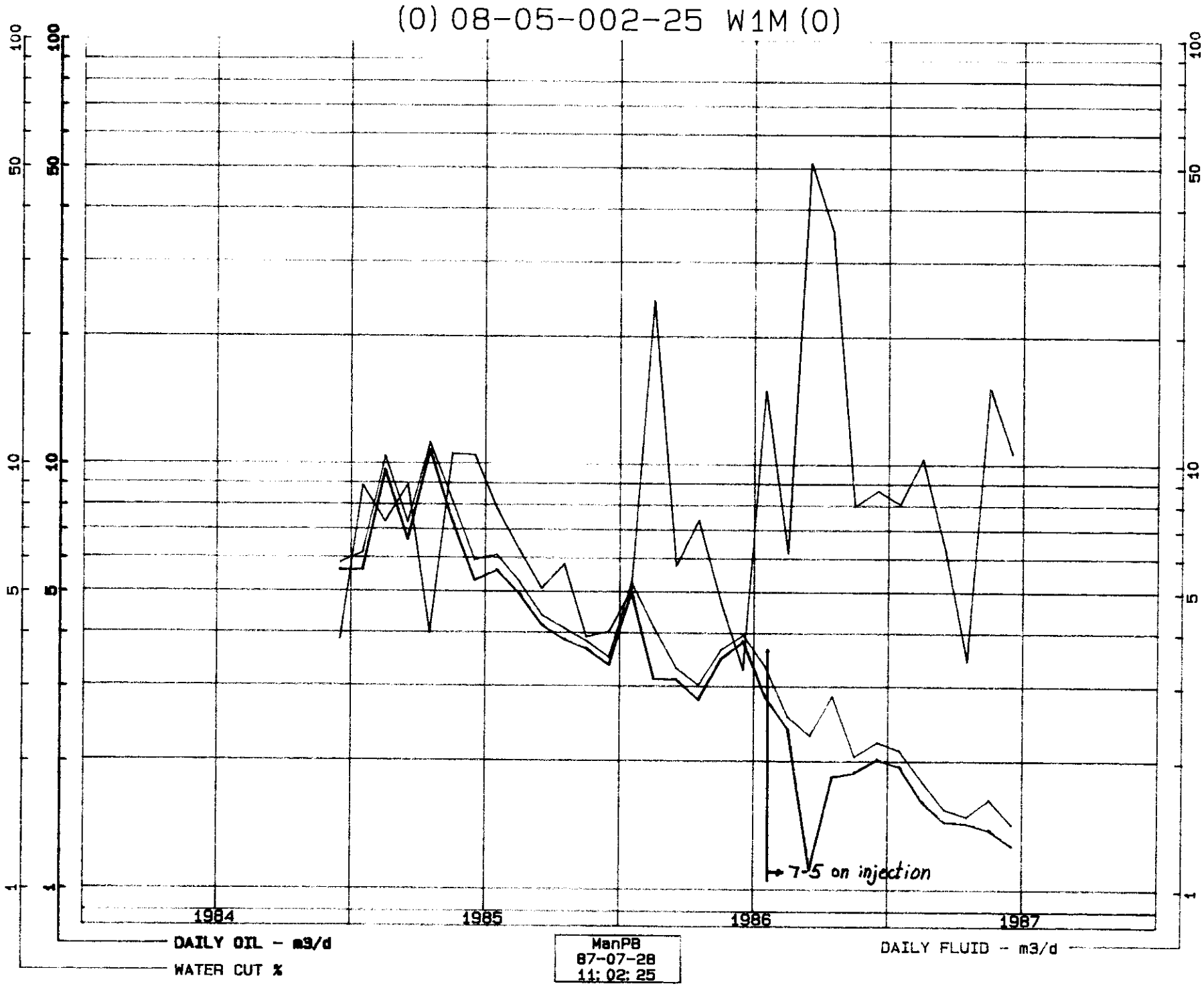

(0) 08-05-002-25 W1M (0)
100
50
10
5
1
1984
1985
1986
1987
7-5 on injection
DAILY OIL - m3/d
WATER CUT %
ManPB
87-07-28
11:02:25
DAILY FLUID - m3/d

FIGURE NO.5

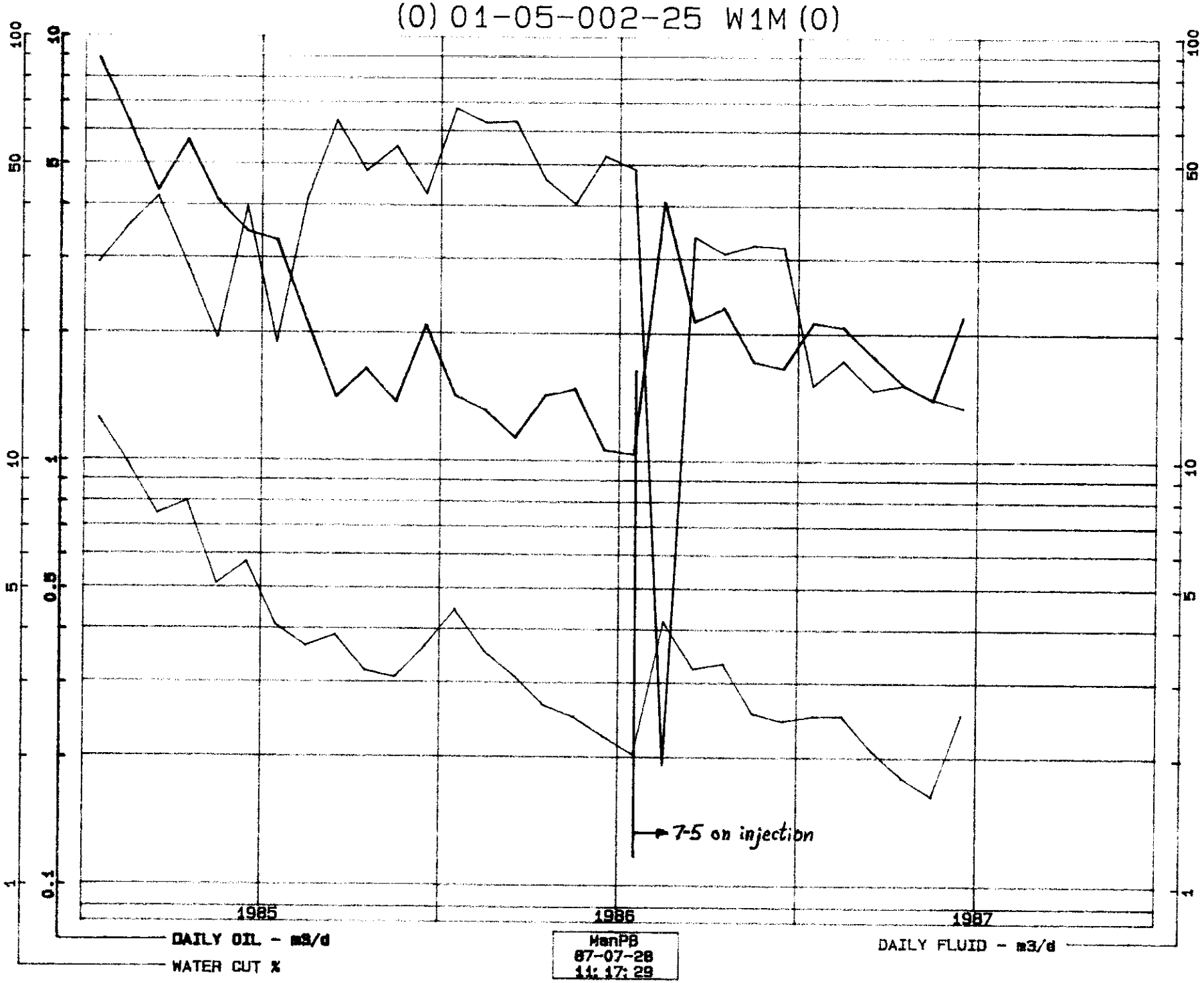
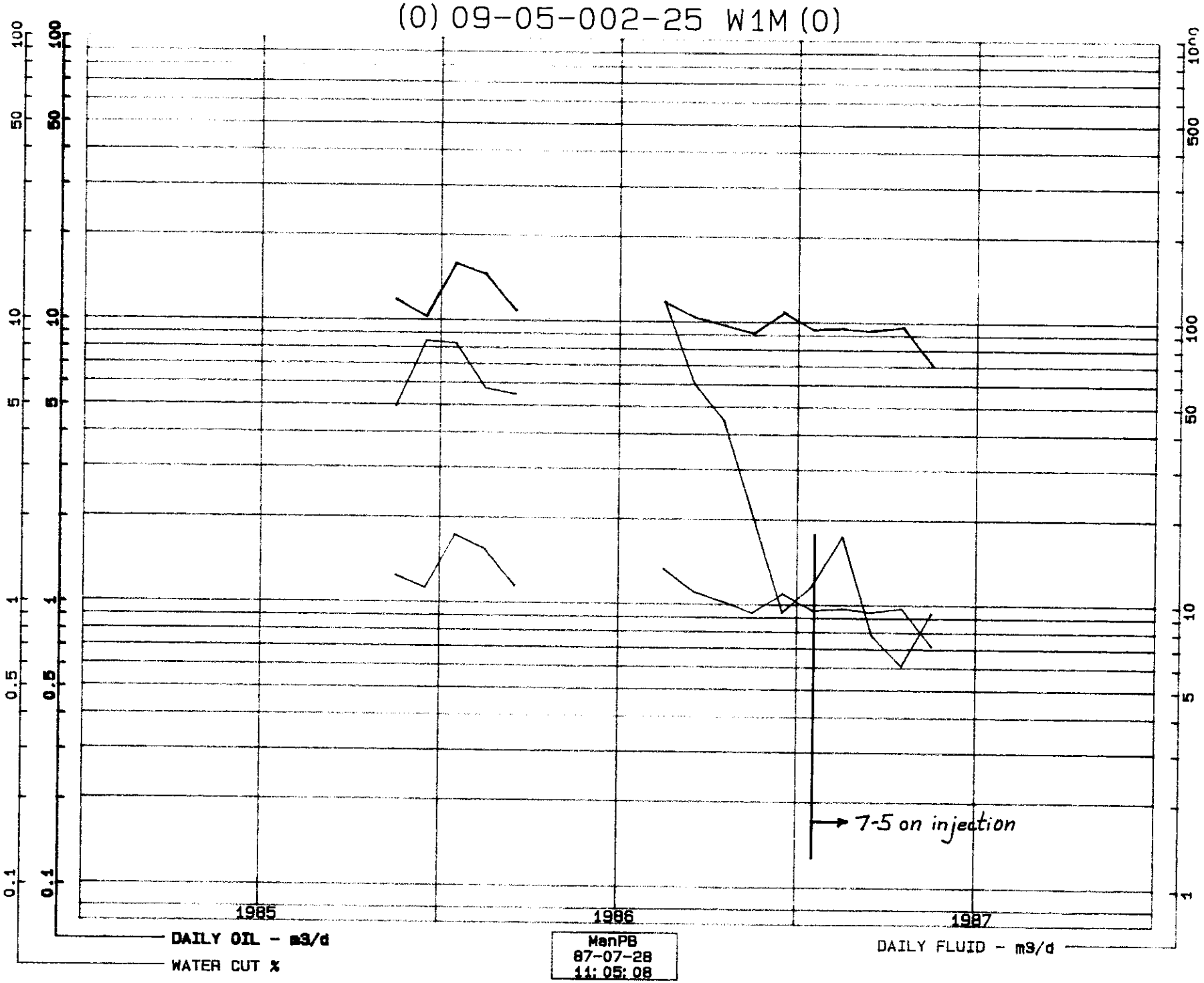
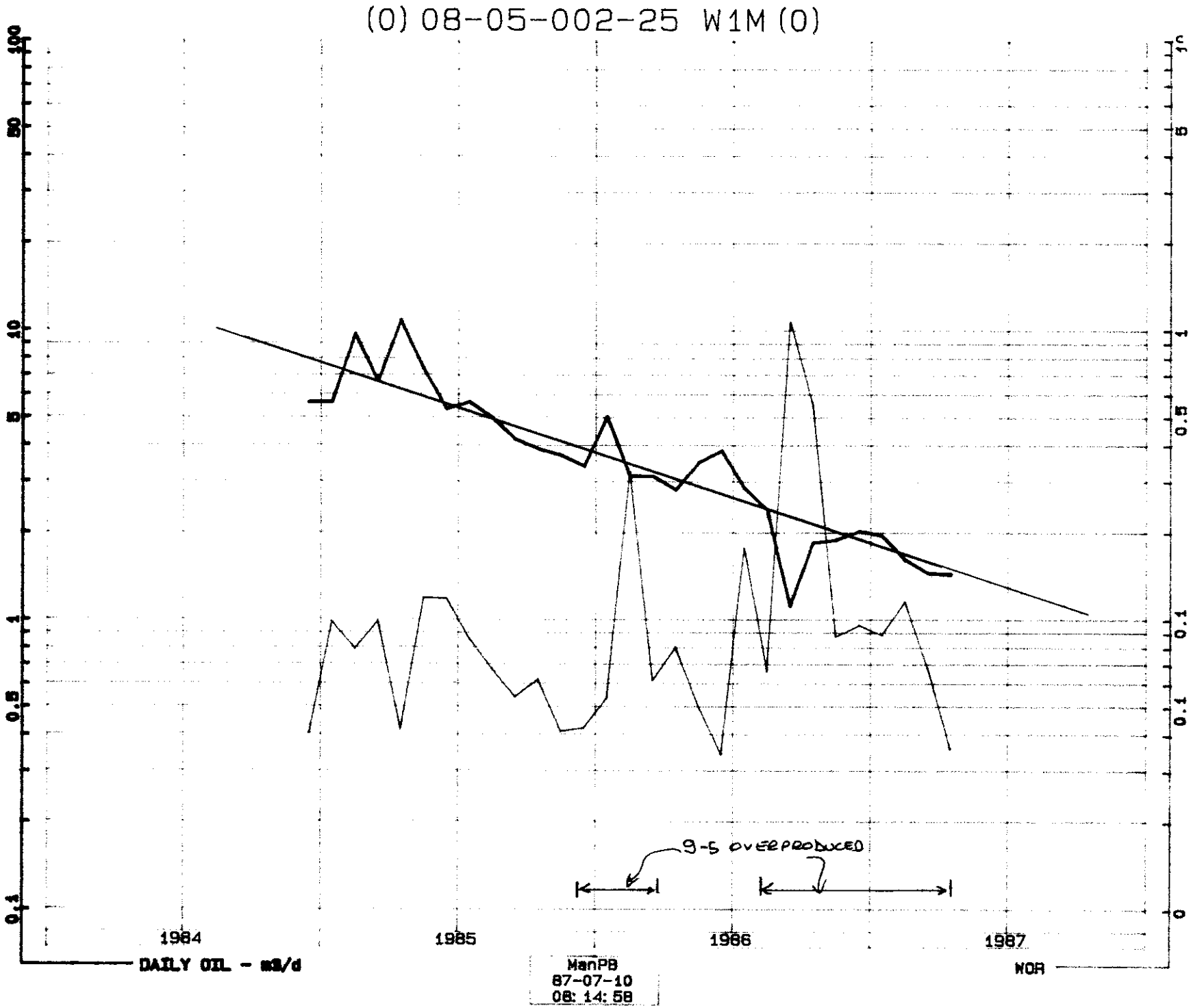

(0) 01-05-002-25 W1M (0)
100
50
10
5
1
10
5
1
0.5
0.1
100
50
10
5
1
1985
1986
1987
7-5 on injection
DAILY OIL - m3/d
WATER CUT %
DAILY FLUID - m3/d
MenPB
87-07-28
11:17:29

FIGURE NO.6


(0) 09-05-002-25 W1M (0)
100
50
10
5
1
0.5
0.1
1000
500
100
50
10
5
1
1985
1986
1987
7-5 on injection
DAILY OIL - m3/d
WATER CUT %
DAILY FLUID - m3/d
ManPB
87-07-28
11:05:08


(0) 08-05-002-25 W1M (0)
100
50
10
5
1
0.5
0.1
1
0.5
0.1
0.1
0
1984
1985
1986
1987
DAILY OIL - m3/d
WOR
9-5 OVERPRODUCED
ManPB
87-07-10
08: 14: 58

OMEGA
HYDROCARBONS LTD

1300 SUN LIFE PLAZA III
112 - 4th AVENUE S.W.
CALGARY, ALBERTA, CANADA T2P 0H3
TELEPHONE (403) 261-0743

July 17, 1987

The Oil and Natural Gas
Conservation Board
309 Legislative Building
450 Broadway Avenue
Winnipeg, Manitoba
R3C 0V8

Attention: Mr. Charles S. Kang
Chairman

Dear Sir:

Re: Waskada Unit No. 16
Exemption from Maximum Permissible Rates

The purpose of this letter is to formally intervene in Enron Canada Ltd.'s recent application for exemption from maximum permissible rates in Waskada Unit No. 16. More specifically we disagree with their request for waiver of accumulated overproduction for well Andex et al Waskada 9-5-2-25 WPM.

Based on historical production data at the offsetting well Omega Waskada 8-5-2-25 WPM, we believe excessive drainage from the subject well has accelerated primary depletion and reduced reservoir pressures in the adjoining areas. This opinion is supported by both the unusual loss of total fluid production and the increasing gas/oil ratio at well 8-5-2-25 WPM during 1986. The recent improvement in gas/oil ratio at well 8-5-2-25 WPM is believed to be due to pressure maintenance in Waskada Unit No. 3, however, to date no improvement in total fluid productivity has been observed.

Omega Hydrocarbons Ltd. requests that exemption from maximum permissible rates not be granted to Waskada Unit No. 16 until such time as the accumulated overproduction at well 9-5-2-25 WPM is reduced to zero.

Yours truly,

OMEGA HYDROCARBONS LTD.

G. E. Patey
Vice- President, Production

cc: B. Dubreuil - Petroleum Branch
Waskada Other Pressure Maintenance
Applications

* * * S T O R E * * *
OMEGA PRODUCTION DATA BASE
WELL (0)07-05-002-25 W1M(0)

Omega
87-07-09
12:49:48

FIELD 1
POOL 1
BLOCK 3
ACCTG 3

PROVINCE MAN.
WORKING INTEREST 100.000000%
ON PRDN 1984-12-08
ON INJN 1986-07-28

LAND#1 0
LAND#2 0
LAND#3 0

MONTH	HOURS	OIL m3/M	WATER m3/M	GAS km3/M	OIL m3/d	WATER m3/d	FLUID m3/d	WOR	GOR m3/m3	I.WATER m3/M	I.GAS km3/M	CUM.OIL m3	CUM.WAT m3	CUM.GAS km3	C.I.WAT m3	C.I.GAS km3
1984-12	519	55.5	66.3	4.1	2.6	3.1	5.6	1.19	74	0.0	0.0	55.5	66.3	4.1	0.0	0.0
1985-01	740	108.0	204.9	8.2	3.5	6.6	10.1	1.90	76	0.0	0.0	163.5	271.2	12.3	0.0	0.0
1985-02	672	15.9	214.5	1.3	0.6	7.7	8.2	13.49	82	0.0	0.0	179.4	485.7	13.6	0.0	0.0
1985-03	404	17.8	100.4	1.4	1.1	6.0	7.0	5.64	79	0.0	0.0	197.2	586.1	15.0	0.0	0.0
1985-04	368	24.7	79.5	2.0	1.6	5.2	6.8	3.23	81	0.0	0.0	221.9	665.6	17.0	0.0	0.0
1985-05	595	62.5	106.6	5.6	2.6	4.4	6.9	1.71	90	0.0	0.0	284.4	772.2	22.6	0.0	0.0
1985-06	589	99.2	52.5	8.4	4.0	2.1	6.2	0.53	85	0.0	0.0	383.6	824.7	31.0	0.0	0.0
1985-07	553	73.9	40.1	6.2	3.2	1.7	4.9	0.54	84	0.0	0.0	457.5	864.8	37.2	0.0	0.0
1985-08	741	98.2	59.3	8.8	3.2	1.9	5.1	0.60	90	0.0	0.0	555.7	924.1	46.0	0.0	0.0
1985-09	684	63.4	60.3	4.6	2.2	2.1	4.3	0.95	73	0.0	0.0	619.1	984.4	50.6	0.0	0.0
1985-10	591	62.9	27.2	2.0	2.6	1.1	3.7	0.43	32	0.0	0.0	682.0	1011.6	52.6	0.0	0.0
1985-11	720	65.0	33.2	3.4	2.2	1.1	3.3	0.51	52	0.0	0.0	747.0	1044.8	56.0	0.0	0.0
1985-12	744	66.1	21.5	5.4	2.2	0.7	2.9	0.32	79	0.0	0.0	813.1	1066.3	61.4	0.0	0.0
1986-01	744	66.5	33.8	4.3	2.1	1.1	3.2	0.51	65	0.0	0.0	881.6	1100.1	65.7	0.0	0.0
1986-02	672	53.9	37.6	1.6	1.9	1.3	3.3	0.70	30	0.0	0.0	935.5	1137.7	67.3	0.0	0.0
1986-03	744	61.3	20.9	3.2	2.0	0.7	2.7	0.34	52	0.0	0.0	996.8	1158.6	70.5	0.0	0.0
1986-04	719	59.9	16.5	4.3	2.0	0.6	2.6	0.28	72	0.0	0.0	1056.7	1175.1	74.8	0.0	0.0
1986-05	712	67.3	10.3	3.4	2.3	0.3	2.6	0.15	51	0.0	0.0	1124.0	1185.4	78.2	0.0	0.0
1986-06	716	55.9	4.7	3.0	1.9	0.2	2.0	0.08	54	0.0	0.0	1179.9	1190.1	81.2	0.0	0.0
1986-07	82	13.7	3.0	1.0	4.0	0.9	4.9	0.22	73	24.8	0.0	1193.6	1193.1	82.2	24.8	0.0
1986-08	600	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	436.3	0.0	1193.6	1193.1	82.2	463.1	0.0
1986-09	672	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	498.5	0.0	1193.6	1193.1	82.2	961.6	0.0
1986-10	649	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	1119.6	0.0	1193.6	1193.1	82.2	2081.2	0.0
1986-11	720	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	1875.6	0.0	1193.6	1193.1	82.2	3956.8	0.0
1986-12	744	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	1240.1	0.0	1193.6	1193.1	82.2	5196.9	0.0
1987-01	744	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	1498.5	0.0	1193.6	1193.1	82.2	6695.4	0.0
1987-02	648	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	881.0	0.0	1193.6	1193.1	82.2	7576.4	0.0
1987-03	672	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	966.9	0.0	1193.6	1193.1	82.2	8543.3	0.0
1987-04	672	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	571.5	0.0	1193.6	1193.1	82.2	9113.8	0.0
1987-05	552	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	632.0	0.0	1193.6	1193.1	82.2	9745.8	0.0

9-5 Start Up

* * * S T O R E * * *
OMEGA PRODUCTION DATA BASE
WELL (0)08-05-002-25 W1M(0)

Omega
87-07-09
12:49:46

FIELD 1
POOL 1
BLOCK 3
ACCTG 3

PROVINCE MAN.
WORKING INTEREST 100.00000%
ON PRDN 1984-12-18
ON INJN NOT ON YET

LAND#1 0
LAND#2 0
LAND#3 0

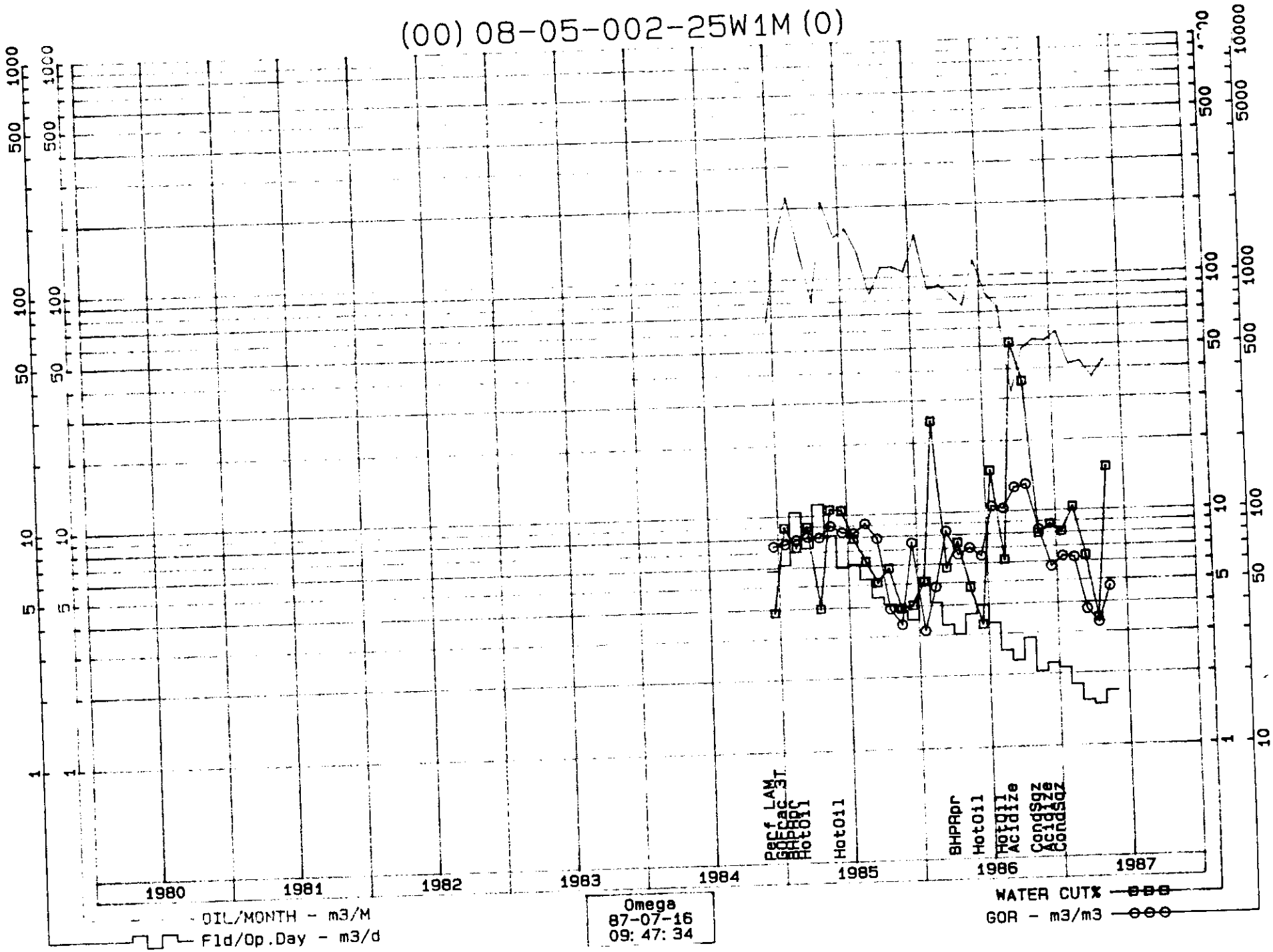
MONTH	HOURS	OIL m3/M	WATER m3/M	GAS km3/M	OIL m3/d	WATER m3/d	FLUID m3/d	WOR	GOR m3/m3	I.WATER m3/M	I.GAS km3/M	CUM.OIL m3	CUM.WAT m3	CUM.GAS km3	C.I.WAT m3	C.I.GAS km3
1984-12	287	67.1	2.7	5.0	5.6	0.2	5.8	0.04	75	0.0	0.0	67.1	2.7	5.0	0.0	0.0
1985-01	635	149.0	14.6	11.3	5.6	0.6	6.2	0.10	76	0.0	0.0	216.1	17.3	16.3	0.0	0.0
1985-02	552	222.2	17.5	17.6	9.7	0.8	10.4	0.08	79	0.0	0.0	438.3	34.8	33.9	0.0	0.0
1985-03	464	128.0	12.6	10.4	6.6	0.7	7.3	0.10	81	0.0	0.0	566.3	47.4	44.3	0.0	0.0
1985-04	177	79.5	3.3	6.4	10.8	0.4	11.2	0.04	81	0.0	0.0	645.8	50.7	50.7	0.0	0.0
1985-05	691	210.7	25.0	19.0	7.3	0.9	8.2	0.12	90	0.0	0.0	856.5	75.7	69.7	0.0	0.0
1985-06	670	148.3	17.4	12.5	5.3	0.6	5.9	0.12	84	0.0	0.0	1004.8	93.1	82.2	0.0	0.0
1985-07	684	160.6	13.7	13.4	5.6	0.5	6.1	0.09	83	0.0	0.0	1165.4	106.8	95.6	0.0	0.0
1985-08	615	126.7	8.5	11.6	4.9	0.3	5.3	0.07	92	0.0	0.0	1292.1	115.3	107.2	0.0	0.0
1985-09	482	83.9	4.5	6.6	4.2	0.2	4.4	0.05	79	0.0	0.0	1376.0	119.8	113.8	0.0	0.0
1985-10	682	109.8	6.8	4.3	3.9	0.2	4.1	0.06	39	0.0	0.0	1485.8	126.6	118.1	0.0	0.0
1985-11	720	110.3	4.5	3.7	3.7	0.2	3.8	0.04	34	0.0	0.0	1596.1	131.1	121.8	0.0	0.0
1985-12	744	104.4	4.4	7.8	3.4	0.1	3.5	0.04	75	0.0	0.0	1700.5	135.5	129.6	0.0	0.0
1986-01	716	149.6	8.0	4.7	5.0	0.3	5.3	0.05	31	0.0	0.0	1850.1	143.5	134.3	0.0	0.0
1986-02	672	87.3	28.3	4.2	3.1	1.0	4.1	0.32	48	0.0	0.0	1937.4	171.8	138.5	0.0	0.0
1986-03	703	91.4	5.6	7.6	3.1	0.2	3.3	0.06	83	0.0	0.0	2028.8	177.4	146.1	0.0	0.0
1986-04	719	83.7	6.7	5.5	2.8	0.2	3.0	0.08	66	0.0	0.0	2112.5	184.1	151.6	0.0	0.0
1986-05	511	74.2	3.7	5.2	3.5	0.2	3.7	0.05	70	0.0	0.0	2186.7	187.8	156.8	0.0	0.0
1986-06	716	114.6	3.9	7.4	3.8	0.1	4.0	0.03	65	0.0	0.0	2301.3	191.7	164.2	0.0	0.0
1986-07	704	83.2	14.7	8.8	2.8	0.5	3.3	0.18	106	0.0	0.0	2384.5	206.4	173.0	0.0	0.0
1986-08	731	72.8	4.6	7.5	2.4	0.2	2.5	0.07	103	0.0	0.0	2457.3	211.2	180.5	0.0	0.0
1986-09	683	31.6	32.8	4.0	1.1	1.2	2.3	1.07	127	0.0	0.0	2488.9	245.0	184.5	0.0	0.0
1986-10	631	46.4	26.6	6.3	1.8	1.0	2.9	0.58	130	0.0	0.0	2537.3	271.6	190.8	0.0	0.0
1986-11	674	53.0	4.6	4.4	1.9	0.2	2.1	0.09	83	0.0	0.0	2590.3	276.2	195.2	0.0	0.0
1986-12	619	52.3	5.0	3.0	2.0	0.2	2.2	0.10	57	0.0	0.0	2642.6	281.2	198.2	0.0	0.0
1987-01	700	56.8	5.0	3.6	1.9	0.2	2.1	0.09	63	0.0	0.0	2699.4	286.2	201.8	0.0	0.0
1987-02	620	41.6	4.8	2.6	1.6	0.2	1.8	0.12	63	0.0	0.0	2741.0	291.0	204.4	0.0	0.0
1987-03	710	42.7	2.9	1.6	1.4	0.1	1.5	0.07	37	0.0	0.0	2783.7	293.9	206.0	0.0	0.0
1987-04	611	36.4	1.3	1.2	1.4	0.1	1.5	0.04	33	0.0	0.0	2820.1	295.2	207.2	0.0	0.0
1987-05	721	42.8	7.7	2.0	1.4	0.3	1.7	0.18	47	0.0	0.0	2862.9	302.9	209.2	0.0	0.0

9-5 StartUp

7-5 Water-Inj StartUp

* * * S T O R E * * *
OMEGA PRODUCTION DATA BASE

Omega
87-07-09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Fld/Op.Day - m3/d
Omega
87-07-16
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WATER CUT%
GOR - m3/m3

Manitoba

Energy and Mines Petroleum

555 — 330 Graham Avenue
Winnipeg, Manitoba, CANADA
R3C 4E3

(204) 945-6577

July 10, 1987

Omega Hydrocarbons Ltd.
1300, 112 - 4th Avenue S.W.
CALGARY, AB T2P 0H3

Attention: Mr. R.A. Brekke

Re: Waskada Unit No. 16
Exemption from Maximum Permissible Rates

Dear Richard:

Attached please find an amendment to an application by Enron Oil Canada Ltd. for exemption from Maximum Permissible Rates in the subject Unit. This amendment requests that accumulated overproduction for the well Andex et al Waskada 9-5-2-25 WPM be waived. Through May 1987, the 9-5 well has an accumulated overproduction of 477.0 m^3.

Production data submitted by Enron in support of its proposed amendment, and reservoir pressure data submitted recently, suggest that overproduction has not resulted in a significant pressure draw down in the area of the well.

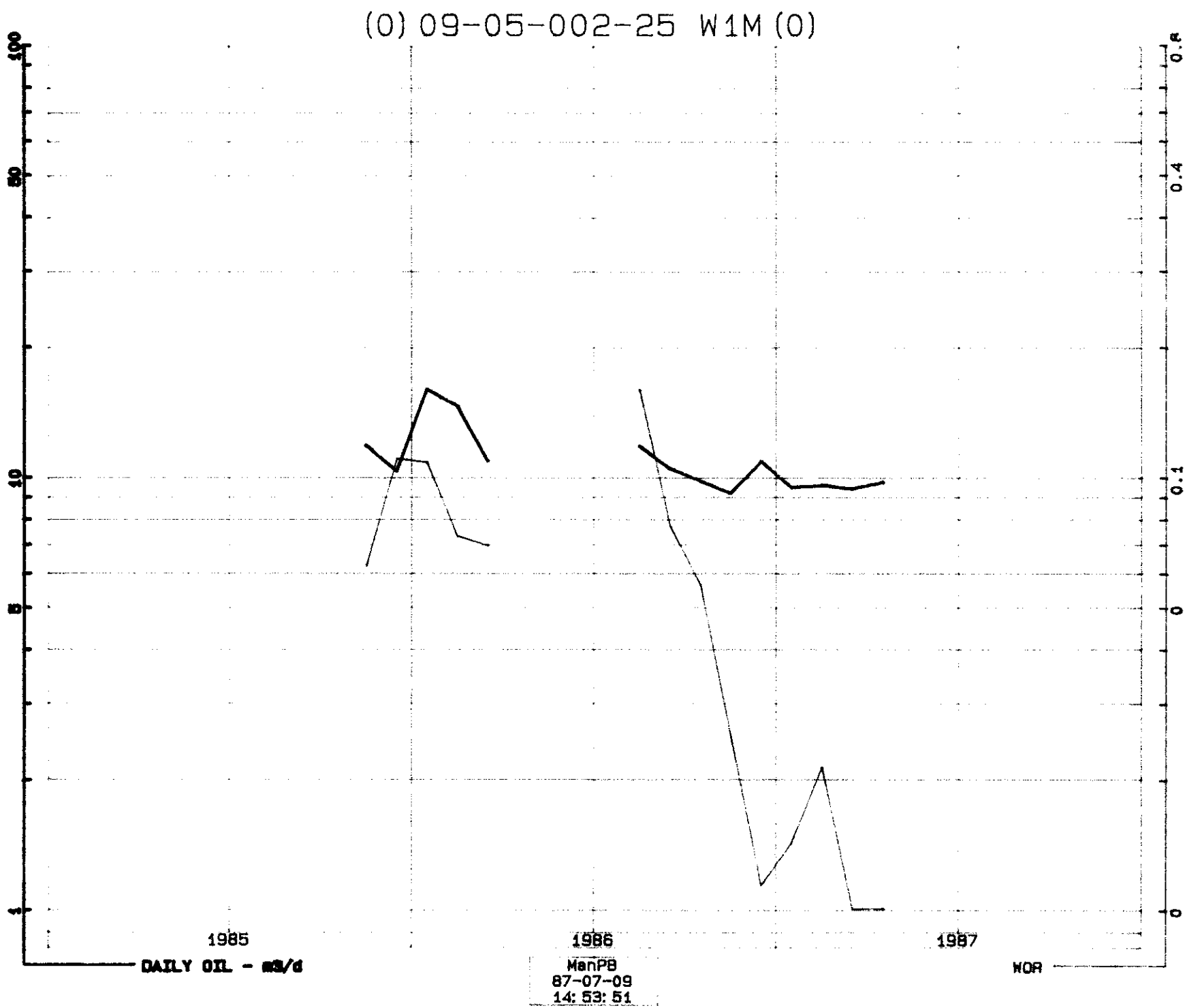
As a potentially affected offset operator, you are requested to contact this office as soon as possible (prior of July 17, 1987) if you have evidence to suggest that overproduction of the 9-5 well has been detrimental to Omega'a operations in the area. If no such evidence is brought to our attention, it will be recommended to the Board that the application (including the amendment) by Enron be approved.

Yours sincerely,

L.R. Dubreuil
Chief Petroleum Engineer
Petroleum Division

LRD:dah

cc: R.A.W. Smith
(Enron Oil Canada Ltd.)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ENRON
Oil Canada Ltd.

(403) 298-2600

6 July 1987

The Oil and Natural Gas Conservation Board
#555, 330 Graham Avenue
Winnipeg, Manitoba
R3C 4E3

Attention: Mr. Charles S. Kang,
Chairman

Dear Sir:

Re: Amendment to Maximum Permissible Production Rates
Waskada Unit No. 16 - Waterflood Project

Enron Oil Canada Ltd. and its working interest partners respectfully submit this amendment to the MPR application dated 19 May 1987, to request that The Oil and Natural Gas Conservation Board also waiver the over-production of 9-5-2-25 WPM.

Discussion

Location 9-5-2-25 WPM commenced production November 1985 with initial rates of 12 m^3/day. As the table of production (exhibited below) demonstrates, the daily rate has been relatively constant. It is Enron's interpretation that the minimal decline rate is evidence that the reservoir pressure has not declined to a point that would adversely affect the reservoir performance. Based on the above interpretation and the fact that water injection commenced June 2, 1987, it is respectfully requested that the over-production status of 9-5 be waived.

1300, 700 - 9th Avenue S.W., Calgary, Alberta T2P 3V4

Production History

	m^3/month	Hours	Water Cut (%)	m^3/d
November 1985	189.1	361	5.0	12.6
December	267.6	610	8.5	10.5
January 1986	415.7	624	8.3	16.0
February	408.6	672	5.8	14.6
March	196.0	432	5.5	10.9
April - July	-	-	-	-
August	354.0	720	11.8	11.8
September	313.0	720	6.1	10.4
October	254.3	624	4.5	9.8
November	274.8	704	2.1	9.4
December	316.2	696	2.3	10.9
January 1987	293.1	720	1.2	9.8
February	268.3	672	1.8	9.6
March	290.7	744	0.8	9.4
April	292.3	720	0.6	9.7

Yours very truly,

ENRON OIL CANADA LTD.

R.A.W. Smith, P.Eng.
Senior Reservoir Engineer

RAWS:pdc

cc: Audax Gas & Oil Ltd., Attention: P.E. McComb
Chauvco Resources Ltd., Attention: E.A. Beaman
Consolidated Pipe Lines Company, Attention: P. Sidey
Highridge Exploration Ltd., Attention: R.T. Vanderham

farmers have joined the Sandy Lands Soil Management Association, which this year has established 12½ miles of new shelterbelts, mainly in the RM of Albert.

Studies show that shelterbelts sharply reduce wind erosion for a distance 10 times the height of the belt on the windward side, and for a distance 20 times the height of the belt on the sheltered, leeward side.

Even heavy clay textured soils, bare of vegetative cover and unprotected by (four in.) of topsoil are removed, it can maintain only about 60 per cent of the yield after 20 centimetres (eight in.) of topsoil are lost.

Doug Southam, Manitoba Agriculture's ag rep at Melita, says that in addition to planting new shelterbelts, the assocation plans to renovate about 50 to 60 miles of shelterbelts established in the Lyleton area in the 1940s and 1950s. Some of the older trees are being bulldozed, Siberian elms are being pruned, caraganas are being trimmed and dead

banks of snow would form against the belt, making it difficult for farmers to work adjacent land early the next spring. Meanwhile, other parts of the field would be relatively dry.

Now, trees are being planted five or six feet apart (and the lower branches are being trimmed) to allow the windblown snow to be spread more widely and evenly over the surrounding field. The belts are stopping some, rather than all, of the snow.

The association, funded under the Canada-Manitoba Agri-Food agreement, is also promoting conservation tillage and green manure crops. Green manures or plowdowns help farmers who summerfallow get extra nitrogen into their fields.

community in Manitoba.

Bacterial inoculants unsuited for hay making

Although bacterial inoculants have been promoted for hay making, the results of their use on Agri-Food test plots in Manitoba have been very poor, says Fraser Stewart, Manitoba Agriculture's grassland specialist for the Eastern Region.

Stewart said they work fairly well on silages by affecting the type of acid produced in the silage. But for drier crops, particularly hay, bacterial inoculants don't appear to offer any worthwhile advantages, he said.

About 10 years ago, acid products were widely used for preserving high moisture forage, and these products remain superior to bacterial inoculants, Stewart said.

Farmers, however, were reluctant to use these acid products because of the possibility the acid would damage their equipment.

There's much less likelihood of that occurring now because buffering agents have been added to most acid-based products, Stewart said. Acid products can be used in both the granular and liquid forms.

In the higher moisture areas of the United States (such as Wisconsin and Minnesota), greater use has been made on forages of drying agents with a potassium carbonate base. These products react with the waxy surface of plant tissue to maximize moisture loss. In some cases these products have cut the drydown rate in half - from about 50 hours to 25 hours.

However, Stewart said this may not be suitable for many Manitoba farmers since it requires 15 to 30 gallons of water per acre (170-340 L/ha) to apply the substance to the forage.

"They pull a sprayer tank behind the swather. You also have to have a special boom to apply it properly to the forage."

Anhydrous ammonia and granular urea (which reacts with water to form ammonia) are also being increasingly used, with good results.

The forage projects with which Stewart is involved are funded under the Canada-Manitoba Agri-Food agreement.

UNDER THE HIGHWAYS PROTECTION ACT AND THE HIGHWAY TRAFFIC ACT

THE HIGHWAY TRAFFIC BOARD

Notice is hereby given that a hearing of The Highway Traffic Board will be held on Tuesday, June 30, 1987 at 10:00 A.M. in Room 204-301 Weston Street, Entrance "D", Winnipeg, Manitoba, R3E 3H4, Phone: 945-8912.

Permits — Part I — Section 9 H.P.A. and Part III — Section 17 H.P.A.

L.A. 177-87-ABS — R. Fridfinnson

Application for a Permit for Building, Two (2) Gas Pumps, Two (2) Signs, Three (3) Underground Storage Tanks and an Access Driveway onto Municipal Road adjacent to and Access Driveway onto P.T.H. No. 68, Lot 2, Plan 18310 R.L. 43 & 44, Township 22, Range 2 East, R.M. of Bifrost (Arborg).

L.A. 178-87-A — H. Remple

Application for a Permit for an Access Driveway onto P.T.H. No. 52, S.W.¼ Section 32-6-7 East, R.M. of LaBroquerie (Steinbach).

L.A. 179-87-A — D. Ward

Application for a Permit for an Access Driveway onto P.T.H. No. 1, S.E.¼, Section 2-9-6 East, R.M. of Tache. (Dufresne).

L.A. 180-87-B — D. Paterson

Application for a Permit for a Building adjacent to P.T.H. No. 1, R.L. 61, Parish of Headingley, City of Winnipeg (Headingley).

L.A. 185-87-A — Dooley Olson Solicitors

Application for a Permit to relocate existing Access Driveway onto P.T.H. No. 9, R.L.'s 48, 49 & 50, Parish of St. Andrews, R.M. of St. Andrews.

L.A. 187-87-S — T. McCullough

Application for a Permit for a Sign adjacent to P.T.H. No. 13, N.E.¼, Section 24-7-5 West, R.M. of Dufferin (Carman).

L.A. 186-87-S — White Horse Plain S.D. #20

Application for a Permit for a Sign adjacent to P.T.H. No. 1 & P.R. No. 248, S.E.¼, Section 11-11-3 West, R.M. of Cartier (Elie).

Speed Zones — Section 97 and 98 — H.T.A.

7000-S — L.G.D. of Grahamdale

Consideration to be given to a reduction in the Speed Limit on Hilbre Access Road and Main Market Road, vicinity of Hilbre, L.G.D. of Grahamdale.

Consideration to be given to a reduction in the Speed Limit on Fishline Road, vicinity of Moosehorn, L.G.D. of Grahamdale.

3000-S — L.G.D. of Consol

Consideration to be given to a reduction in the Speed Limit from 90 km/h to 70 km/h on Francoeur Road, Francoeurville Settlement, L.G.D. of Consol.

The Highway Traffic Board will be prepared to consider all submissions written or oral on the above Applications by contacting the Secretary prior to, or at the hearing.

A. POLTARUK, MMM CD
Secretary.

9682—25

UNDER THE MINES ACT

NOTICE
WASKADA OIL FIELD

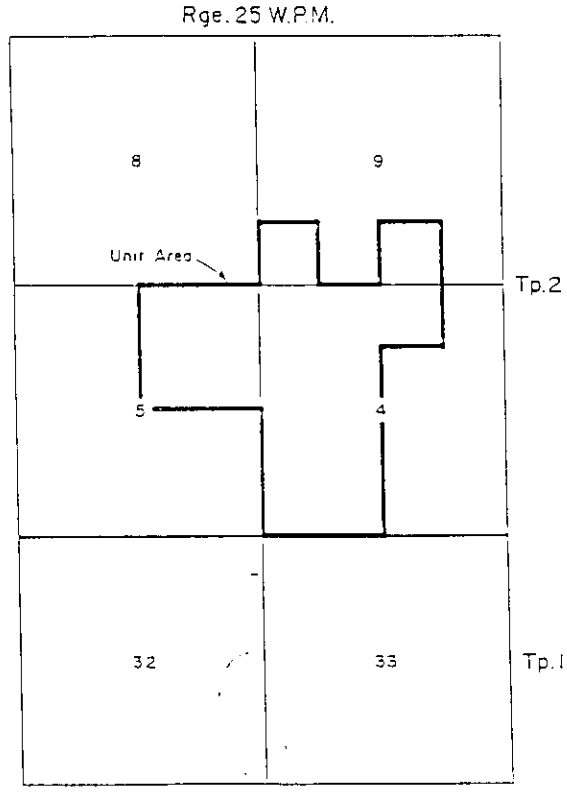
Enron Oil Canada Ltd. has made application for exemption from the maximum permissible rate (MPR) limitations of subsection 51(1) of The Petroleum Drilling and Production Regulations, 1984 for wells in the Waskada Unit No. 16 as outlined below.

If no valid objection or intervention in writing is received by the Board at Room 309, Legislative Building, Winnipeg, Manitoba, R3C 0V8, within 14 days of the publication of this notice, the Board may approve the application.

Date: June 2, 1987.

CHARLES S. KANG,
Chairman.

9681—25



Wallace to Senf

I, Ute Wallace, of the City of Winnipeg, Receptionist, have been issued a Change of Name Certificate to Ute Leanna Senf.
Date: June 3, 1987.
9668—25

Waywood to Waywood

I, Jeanne Waywood, of the City of Winnipeg, Retired, have been issued a Change of Name Certificate to Jean Waywood.
Date: June 2, 1987.
9669—25

Westhaver to Fife

I, Pamela Adell Fife, of the City of Winnipeg, Sales person, have been issued a Change of Name Certificate for my unmarried infant child, Felicia Adell Westhaver to Felicia Adell Fife.
Date: June 3, 1987.
9670—25

"MURIEL ANN SMITH",
Minister of Community Services.

UNDER THE COOPERATIVES ACT

Notice is hereby given that under The Cooperatives Act, the following Certificates have been issued:

CERTIFICATES OF INCORPORATION

Artsite Housing Cooperative, Ltd.
Date: May 27, 1987
Registered Office: 512-283 Portage Avenue, Winnipeg, Manitoba, R3B 2B5
9693—25

Our Day Care Brandon Co-op Inc.
Date: May 28, 1987
Registered Office: 248-4th Street, Brandon, Manitoba, R7A 3G8
9694—25

R. CHENIER,
Registrar.

UNDER THE HIGHWAY TRAFFIC ACT

Take notice that The Motor Transport Board intends to grant the following authorities, or extensions of authorities to operate public service vehicles, unless a Statement of Opposition to the relevant application is filed with the Document Control Officer of the Board, 200-301 Weston Street, Winnipeg, R3E 3H4, by 4:30 P.M., MONDAY, JULY 13, 1987.

Docket 13389
Albert Jacob Cook,
Grand Rapids, Manitoba.

Application for authority to operate an Inter-Municipal Livery to be based at Grand Rapids, Manitoba.

Shipper Support — Origins and Destinations of Service Required.

1. Local Government District of Grand Rapids — To and from Grand Rapids, Manitoba to and from various points in Manitoba.

Docket 13386
Floyd Dunford Limited,
Woodstock, Ontario.

Application for Public Service Vehicle Certificate for transportation, in bulk in tank vehicles, of liquid glucose, high fructose corn syrup and dry starches for Gasco Company, a partnership of Canada Starch Inc., Quebec Maple Products Inc., Ault Food Limited and Labatt Brewing Company Limited, from points in Ontario to points in Manitoba.

Shipper Support — Origins and Destinations of Service Required.

1. Canada Starch Company Inc. — From London, Cardinal and Port Colborne, Ontario to points in the Province of Manitoba.

A fee $50.00 shall accompany the Statement of Opposition.

No Statement of Opposition will be accepted after the date of MONDAY, JULY 13, 1987.

All Respondents shall immediately receive from the Board a copy of the relevant application and supporting documents.

All Respondents shall also file with the Document Control Officer further statements and other documents, certified as true and correct which, together with the Statement of Opposition, if unanswered, are sufficient to demonstrate that the public convenience will not be promoted by the granting of the authority in question. Such further material shall be filed within 14 days of receipt of the copy of the application and supporting documents or, on or before MONDAY, JULY 27, 1987.

L. G. OLIJNEK,
Secretary,
9699—25 THE MANITOBA MOTOR TRANSPORT BOARD.

June 8, 1987

Queen's Printer
Statutory Publications
200 Vaughan Street

L. R. Dubreuil
Chief Petroleum Engineer
Petroleum Division
Energy & Mines

MANITOBA GAZETTE

Please print the attached Notice in the next issue of the Manitoba Gazette under The Mines Act.

L. R. Dubreuil

CH/ch

Attachment

Manitoba

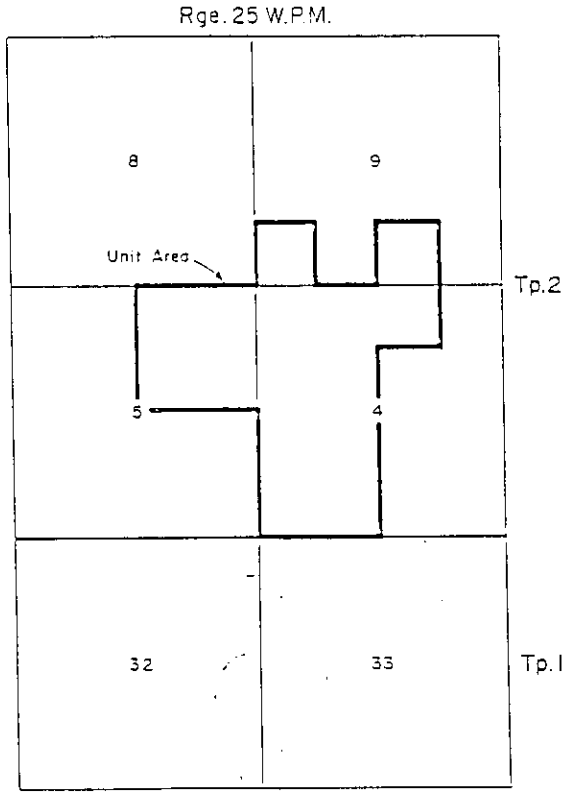
The Oil and Natural Gas
Conservation Board

Room 309
Legislative Building
Winnipeg, Manitoba, CANADA
R3C 0V8

(204) 945-3130

NOTICE
WASKADA OIL FIELD

Enron Oil Canada Ltd. has made application for exemption from the maximum permissible rate (MPR) limitations of subsection 51(1) of The Petroleum Drilling and Production Regulations, 1984 for wells in the Waskada Unit No. 16 as outlined below.



If no valid objection or intervention in writing is received by the Board at Room 309, Legislative Building, Winnipeg, Manitoba, R3C 0V8, within 14 days of the publication of this notice, the Board may approve the application.

Date: June 2, 1987

Charles S. Kang
Chairman

Manitoba

Memorandum

Date June 2, 1987

To The Oil and Natural Gas Conservation Board

Charles S. Kang - Chairman
Wm. McDonald - Deputy Chairman
B. Ball - Member

From H. Clare Moster
Executive Director
Petroleum Division

Subject

Telephone

RE: WASKADA UNIT NO. 16

First | Fold

Exemption from Maximum Permissible Rates:

Enron Oil Canada Ltd., as operator of Waskada Unit No. 16 has applied for exemption from the maximum permissible rate (MPR) restrictions of subsection 51(1) of The Petroleum Drilling and Production Regulations, 1984.

Recommendations:

It is recommended that notice of the application be published in the Manitoba Gazette and the Deloraine Times and Star. In addition, a copy of the notice should be sent to Omega Hydrocarbons Ltd. A proposed notice is attached.

In the absence of objections or interventions, it is recommended that the application be approved, conditional on demonstrated ability to replace reservoir voidage with water injection and on acceptable pressure levels, and that Board Order No. 76A (draft attached) be issued.

Discussion:

The increased recoverable reserves anticipated in this type of project result in part from increased reservoir pressures due to injection in the project area. This increased pressure also results in a pressure gradient from the project area to surrounding non-pressure maintained lands. Due to this pressure gradient, fluid flow from the pressure maintained areas to the surrounding area may occur with the result that recoverable reserves may be lost to the operator who initiated the enhanced recovery project. Exemption from MPR restrictions is a way of counteracting this.

The danger of unrestricted production rates is that reservoir pressures will eventually be drawn down below the bubble point allowing excess gas production to occur and thereby jeopardizing recovery. To minimize the risk of this pressure draw down, provisions are included in the proposed Board Order requiring a minimum reservoir pressure somewhat in excess of the bubble point to be built up and maintained, and requiring replacement of reservoir voidage before MPR exemption is effective.

Figure No. 1 shows current (March, 1987) oil production rates for Waskada Unit No. 16. Note that at present, only one of the wells has the capability of exceeding the MPR (= 240 m^3/month - 30.4 days/month = 7.9 m^3/day). However, it is possible that production response could result in the MPR being a restriction for a number of wells. The well located in Lsd 9 of Section 5-2-25 (WPM) is currently in an overproduced status. This has been brought to Enron's attention, and its immediate action has been requested.

Because approval of the application could affect Omega Hydrocarbons Ltd., it is proposed that a notice be sent to this company.

Original Signed by H. C. Moster

H. Clare Moster

MA/LRD/lk

1314P

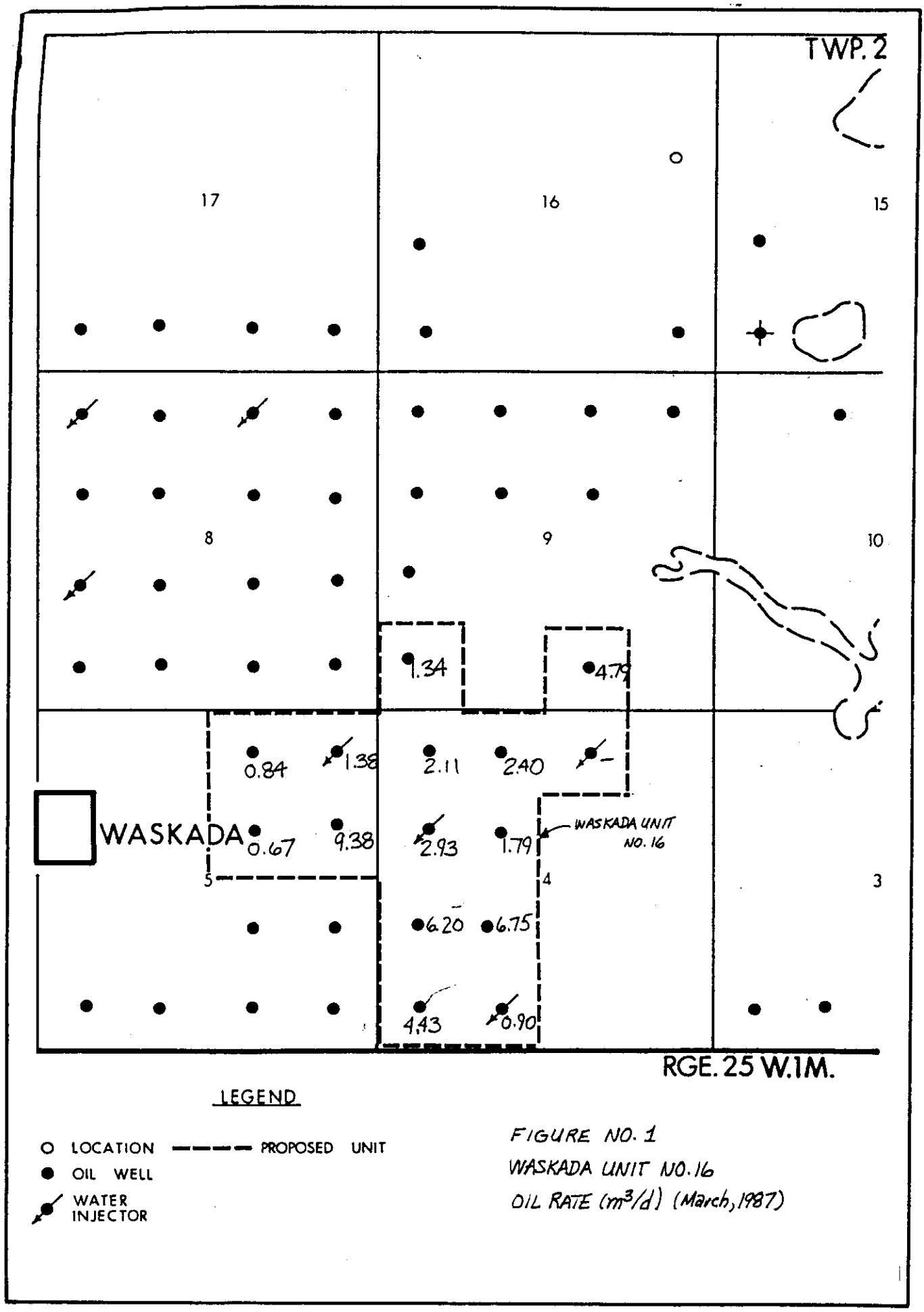


FIGURE NO. 1
WASKADA UNIT NO. 16
OIL RATE (m^3/d) (March, 1987)

Manitoba

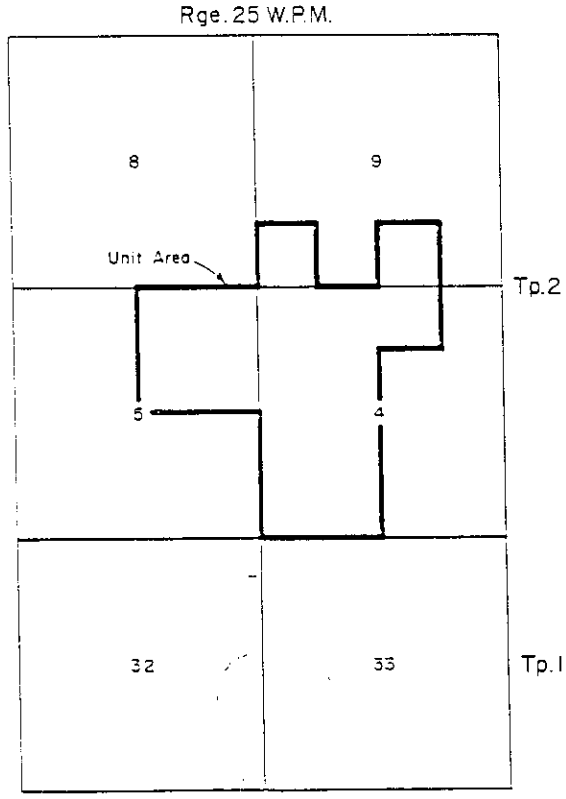
The Oil and Natural Gas Conservation Board

Room 309
Legislative Building
Winnipeg, Manitoba, CANADA
R3C 0V8

(204) 945-3130

NOTICE
WASKADA OIL FIELD

Enron Oil Canada Ltd. has made application for exemption from the maximum permissible rate (MPR) limitations of subsection 51(1) of The Petroleum Drilling and Production Regulations, 1984 for wells in the Waskada Unit No. 16 as outlined below.



If no valid objection or intervention in writing is received by the Board at Room 309, Legislative Building, Winnipeg, Manitoba, R3C 0V8, within 14 days of the publication of this notice, the Board may approve the application.

Date: June 2, 1987

Charles S. Kang
Chairman

Manitoba

Energy and Mines Petroleum

555 — 330 Graham Avenue
Winnipeg, Manitoba, CANADA
R3C 4E3

(204) 945-6577

June 2, 1987

Enron Oil Canada Limited
1300, 700 - 9th Avenue S.W.
CALGARY, Alberta T2P 3V4

Attention: R.A. Schultz
Chief Production Engineer

Re: Andex et al Waskada 9-5-2-25 (WPM)

Dear Rick:

Review of production records indicate the subject well has a cumulative overproduction of 496.7 m^3 through April 1987. Details of the overproduction calculations are attached. Note that there are no provisions in the Regulations to permit carrying forward of underproduction.

You are referred to subsection 51(6) of the Regulations which requires that a well with cumulated overproduction in excess of its maximum permissible monthly production rate be shut in until such overproduction has been eliminated. Your immediate attention to this matter is requested.

Yours sincerely,

L.R. Dubreuil
Chief Petroleum Engineer
Petroleum Division

LRD:dah

cc: Waskada Office

OVER/UNDERPRODUCTION REPORT

WELL: 9-5-2-25 (WPM)

ALLOWABLE Daily: 9.5
Monthly: 240

Month	Days	Days Produced	Allowable	Production	Over/(Under)
Aug 86	31	30	240	354.0	114.0
Sept. 86	30	30	240	313.0	187.0
Oct. 86	31	26	240	254.3	201.3
Nov. 86	30	30	240	274.8	236.1
Dec. 86	31	29	240	316.2	312.3
Jan. 87	31	31	240	293.1	365.4
Feb. 87	28	28	240	268.3	393.7
Mar. 87	31	31	240	290.7	444.4
Apr. 87	31	30	240	292.3	496.7

ENRON
Oil Canada Ltd.

(403) 298-2600

19 May 1987

The Oil and Natural Gas Conservation Board
#555, 330 Graham Avenue
Winnipeg, Manitoba
R3C 4E3

Attention: Mr. Charles S. Kang,
Chairman

Dear Sir:

Re: Maximum Permissible Production Rates
Waskada Unit No. 16 - Waterflood Project

Enron Oil Canada Ltd. and its working interest partners respectfully submit this application pursuant to Section 121 of the Petroleum Regulations for maximum permissible production rates.

DISCUSSION

The area of application includes all the wells within the Waskada Unit No. 16. For pertinent information regarding the individual well performance, please refer to the Pressure Maintenance Application dated December 1, 1986, plus subsequent amendments.

With regards to capability to replace voidage, we are fully confident that, based on analogous performance of injectors within the Waskada Spearfish, the wells within Unit No. 16 will have excess injection capacity to replace cumulative voidage in the short term and then to maintain monthly voidage thereafter. Page 2, paragraph 5 ii) of the same application discusses in detail the excellent improvement in flow capacity as an operator converts a producer to an injector.

Injection well conversion is complete and injection should commence June 1, 1987, allowing sufficient time (four weeks) of shut in time to acquire representative pressure data.

1300, 700 - 9th Avenue S.W., Calgary, Alberta T2P 3V4

Table 2 of the October 1986 study that accompanied the Pressure Maintenance Application reviews the pressure data to the end of July 1986. Additional pressure information acquired since then is summarized as follows:

August 29, 1986	
4-9-2-25	Pws = 993 psia
15-4-2-25	Pws = 1,029 psia
February 18, 1987	
5-9-2-25	Pws = 1,168 psia
15-4-2-25	Pws = 1,135 psia

The detailed pressure information can be found on the attached Tables 1 and 2. The pressure survey that accompanies injection well conversion will be available in two to three weeks and will be subsequently forwarded.

Yours very truly,

ENRON OIL CANADA LTD.

R.A.W. Smith, P.Eng.
Senior Reservoir Engineer

RAWS:pdc
attach

cc: Audax Gas & Oil Ltd., Attention: P.E. McComb
Chauvco Resources Ltd., Attention: E.A. Beaman
Consolidated Pipe Lines Company, Attention: P. Sidey
Highridge Exploration Ltd., Attention: R.T. Vanderham

WASPRES8.DAT

TABLE No. 1

WASKADA, MANITOBA
SPEARFISH FORMATION
ACOUSTIC PRESSURE DATA
FEB 18 ,1987 (AVG of 3 AWS)

OIL GRADIENT (37 API) = 0.3630 psi/ft
8.2116 kPa/m

WATER GRADIENT = 0.439 psi/ft
9.9308 kPa/m

WELL LOCATION	MID.PT PERFS (mKB)	MID.PT PERFS (ft KB)	DEAD WT. PRESSURE (kPag)	FLUID LEVEL (m)	GAS COLUMN (ft)	WATER CUT %	OIL COLUMN (ft)	WATER COLUMN (ft)	GAS GRADIENT (PSI/ft)	ACOUSTIC PRESSURE Pws (PSIA)
4-4-2-25W1	897.5	2945			0		2945	0		---
5-4-2-25W1	895.0	2936			0		2936	0		---
6-4-2-25W1	890.5	2922			0		2922	0		---
11-4-2-25W1	889.4	2918			0		2918	0		---
12-4-2-25W1	888.0	2913			0		2913	0		---
13-4-2-25W1	884.5	2902			0		2902	0		---
14-4-2-25W1	891.0	2923			0		2923	0		---
15-4-2-25W1	891.5	2925	250	0.00	0	10	2632	292	0.0003	1135
9-5-2-25W1	890.0	2920			0		2920	0		---
10-5-2-25W1	890.0	2920			0		2920	0		---
15-5-2-25W1	893.0	2930			0		2930	0		---
16-5-2-25W1	891.0	2923			0		2923	0		---
4-9-2-25W1	887.5	2912			0		2912	0		---
5-9-2-25W1	886.0	2907	100	67.20	220	80	537	2149	0.0003	1168
10-9-2-25W1	884.0	2900			0		2900	0		---
15-9-2-25W1	882.8	2896			0		2896	0		---
16-9-2-25W1	882.0	2894			0		2894	0		---
14-10-2-25W1	875.5	2872			0		2872	0		---
5-15-2-25W1	874.0	2867			0		2867	0		---
10-15-2-25W1	873.0	2864			0		2864	0		---

WASPRES7 DAT

TABLE No. 2

WASKADA, MANITOBA
SPEARFISH FORMATION
ACOUSTIC PRESSURE DATA
AUG 27-29 ,1986 (AVG of 3 AWS)

OIL GRADIENT (37 API) = 0.3630 psi/ft
8.2116 kPa/m

WATER GRADIENT = 0.439 psi/ft
9.9308 kPa/m

WELL LOCATION	MID.PT PERFS (mKB)	MID.PT PERFS (ft KB)	DEAD WT. PRESSURE (kPag)	FLUID LEVEL (m)	GAS COLUMN (ft)	WATER CUT %	OIL COLUMN (ft)	WATER COLUMN (ft)	GAS GRADIENT (PSI/ft)	ACOUSTIC PRESSURE Pws (PSIA)
4-4-2-25W1	897.5	2945			0		2945	0		---
5-4-2-25W1	895.0	2936			0		2936	0		---
6-4-2-25W1	890.5	2922			0		2922	0		---
11-4-2-25W1	889.4	2918			0		2918	0		---
12-4-2-25W1	888.0	2913			0		2913	0		---
13-4-2-25W1	884.5	2902			0		2902	0		---
14-4-2-25W1	891.0	2923			0		2923	0		---
15-4-2-25W1	891.5	2925	1	57.70	189	10	2462	274	0.0003	1029
9-5-2-25W1	890.0	2920			0		2920	0		---
10-5-2-25W1	890.0	2920			0		2920	0		---
15-5-2-25W1	893.0	2930			0		2930	0		---
16-5-2-25W1	891.0	2923			0		2923	0		---
4-9-2-25W1	887.5	2912	1	144.30	473	50	1219	1219	0.0003	993
5-9-2-25W1	886.0	2907			0		2907	0		---
10-9-2-25W1	884.0	2900			0		2900	0		---
15-9-2-25W1	882.8	2896			0		2896	0		---
16-9-2-25W1	882.0	2894			0		2894	0		---
14-10-2-25W1	875.5	2872			0		2872	0		---
5-15-2-25W1	874.0	2867			0		2867	0		---
10-15-2-25W1	873.0	2864			0		2864	0		---