

Daly Unit No. 4  
Annual Progress Report  
1989-01-01 to 1989-12-31



## **Chevron Canada Resources**

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1990-04-11

### **Daly Unit No. 4 Annual Progress Report**

**TO: ALL WORKING INTEREST OWNERS  
DALY UNIT NO. 4**

Gentlemen:

Enclosed is a copy of the Daly Unit No. 4 Annual Progress Report for the period ending 1989-12-31. If further communication on this report is required, please contact Katherine Rouse at (403) 234-5088.

Yours very truly,

A handwritten signature in cursive script, appearing to read "Scott Robinson".

**D. S. ROBINSON, Chairman,  
Operating Committee**

KER/kt  
Encl.

**DALY UNIT NO. 4  
PROGRESS REPORT NO. 2  
1989-01-01 TO 1989-12-31**

**CHEVRON CANADA RESOURCES  
PRODUCING DEPARTMENT  
1990-04**

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## DALY UNIT NO. 4

### I. INTRODUCTION

Daly Unit No. 4 became effective 1988-04-01. This report summarizes the operations of the Unit for the period 1989-01-01 to 1989-12-31. A map of the Unit area is presented as Figure 1.

### II. OPERATIONS

#### A. Production

Oil production for the Unit during the report period averaged 33 m<sup>3</sup>/d with a GOR of 21 m<sup>3</sup>/m<sup>3</sup> and a water cut of 86%. This compares with an average oil production rate of 34 m<sup>3</sup>/d, a GOR of 21 m<sup>3</sup>/m<sup>3</sup> and a water cut of 84% during the previous report period. Cumulative field production to 1989-12-31 was 109 255 m<sup>3</sup>. Cumulative production since commencement of waterflood to 1989-12-31 was 21 159 m<sup>3</sup>. Details of production data are shown on Table 1 as well as graphically in Figure 2.

#### B. Water Injection

Total water injected during the report period averaged 186 m<sup>3</sup>/d. This compares with 197 m<sup>3</sup>/d injected during the previous report period. Cumulative water injected from commencement of waterflood to 1989-12-31 was 72 948 m<sup>3</sup>. Details of water injection data are shown on Table 2 as well as graphically in Figure 3.

#### C. Well Workovers

##### 1. Recompletions

1C-35-09-28: Attempted to convert well to injection.

1989-09: Attempted a 2 m<sup>3</sup> coiled tubing cement squeeze to shut off high pressure disposal zone. Squeeze was unsuccessful.

1989-10: Performed a 4 m<sup>3</sup> cement squeeze to shut off high pressure disposal zone. Set bridge plug and perforated Unnamed and Upper Daly zones. Communication with high pressure disposal zone evident with a shut-in pressure of 7 MPa and a flow rate of 35 m<sup>3</sup>/hour. Ran temperature log, set cement retainer above perfs and suspended well pending further investigation.

## 2. Stimulations

06-25-09-28: Performed a 1.5 m<sup>3</sup> 15% HCl acid scale removal stimulation and changed pump during 1989-05. There was no change in the production rate.

04-35-09-28: Performed a 1.5 m<sup>3</sup> 15% HCl acid scale removal stimulation and changed pump during 1989-03. Production increased from 1 m<sup>3</sup> OPD at 33% water cut to 1.54 m<sup>3</sup> OPD at 40% water cut.

06-35-09-28: Stimulated well during 1989-10 with 1.5 m<sup>3</sup> 15% HCl acid to remove scale. There was no change in the production rate.

13-35-09-28: Performed a 1.5 m<sup>3</sup> 15% HCl acid scale removal stimulation and changed pump during 1989-03. Production increased from 0.5 m<sup>3</sup> OPD at 22% water cut to 1.21 m<sup>3</sup> OPD at 38% water cut.

04-01-10-28: Performed a 1.5 m<sup>3</sup> 15% HCl acid scale removal stimulation during 1989-11. The well has not yet been tested for production rate increase.

D. Miscellaneous

Conducted the Unit wide annual reservoir pressure survey during 1989-05. Tested 15 producing wells, two suspended wells and one injection well.

Performed at total of three Visscale 4987 scale inhibitor treatments on producing wells 6-25, 6-35 and 13-35-9-28.

III. RESERVOIR PERFORMANCE

A. Voidage

The net voidage during the report period was 15 609 Rm<sup>3</sup> for a net voidage rate of 43 Rm<sup>3</sup>/d. The voidage replacement ratio was 0.81. Cumulative net voidage from commencement of waterflood to 1989-12-31 was 67 742 Rm<sup>3</sup>. Voidage calculations are shown on Table 3.

B. Reservoir Pressure

The annual pressure survey was conducted during 1989-05. The results of the survey are shown on Table 4.

C. Recovery

Cumulative field production to 1989-12-31 was 109 255 m<sup>3</sup>. This represents a recovery to date of 2% of the original oil-in-place which is estimated at 5 401 961 m<sup>3</sup>.

TABLE 1

**DALY UNIT NO. 4**  
**PRODUCTION DATA**

<u>Month</u>	Oil Production		Gas Production <u>10<sup>3</sup> m<sup>3</sup></u>	Water Production <u>m<sup>3</sup></u>	GOR <u>m<sup>3</sup>/m<sup>3</sup></u>	Water Cut <u>%</u>
	<u>m<sup>3</sup></u>	<u>m<sup>3</sup>/d</u>				
1989-01	1 028.6	33.2	21.7	6 318.9	21	86.00
1989-02	909.3	32.5	19.4	5 101.1	21	84.87
1989-03	1 067.7	34.4	22.3	5 955.1	21	84.80
1989-04	996.5	33.2	21.3	6 093.1	21	85.97
1989-05	771.8	24.9	16.0	4 943.7	21	86.50
1989-06	947.4	31.6	20.2	5 239.2	21	84.69
1989-07	1 061.3	34.2	22.6	6 001.0	21	84.97
1989-08	1 103.4	35.6	23.4	6 285.8	21	85.07
1989-09	1 006.5	33.6	21.4	6 116.7	21	85.87
1989-10	1 023.9	33.0	21.6	6 567.0	21	86.51
1989-11	994.6	33.2	20.8	6 162.6	21	86.10
1989-12	1 019.5	32.9	20.9	6 182.1	21	85.84
Totals	11 931.0	32.7	251.6	70 966.3	21	85.61
Pre-Unit Production	88 096.0		0.0	197 320.0		
Cumulative To 1988-12-31	9 228.0		196.1	48 554.0		
Cumulative To 1989-12-31	21 159.0		447.7	119 520.3		
Total Cumulative Production	109 255.0		447.7	316 840.6		

TABLE 2

DALY UNIT NO. 4  
WATER INJECTION DATA

<u>Month</u>	Water Injection 15D-27		Cumulative Water Injection <u>m<sup>3</sup></u>
	<u>m<sup>3</sup></u>	<u>m<sup>3</sup>/d</u>	
1989-01	6 414.8	206.9	11 477.3
1989-02	5 242.0	187.2	16 719.3
1989-03	6 104.3	196.9	22 823.6
1989-04	6 242.0	208.1	29 065.6
1989-05	635.0	20.5	29 700.6
1989-06	5 368.0	178.9	35 068.6
1989-07	6 175.0	199.2	41 243.6
1989-08	6 429.0	207.4	47 672.6
1989-09	6 209.0	207.0	53 881.6
1989-10	6 522.0	210.4	60 403.6
1989-11	6 267.0	208.9	66 670.6
1989-12	6 277.0	202.5	72 947.6
Total	67 885.1	186.0	

TABLE 3

DALY UNIT NO. 4  
VOIDAGE CALCULATIONS  
FROM 1989-01-01 TO 1989-12-31

OIL FVF = 1.05 Res.  $\text{m}^3$   
SOLN GOR = 16  $\text{m}^3/\text{m}^3$

Month	Oil Prod. $\text{m}^3$	Gas Prod. $10^3 \text{ m}^3$	Water Prod. $\text{m}^3$	Oil Voidage $\text{Rm}^3$	Total Voidage $\text{Rm}^3$	Total Injection $\text{Rm}^3$	Net Voidage $\text{Rm}^3$	Net $\text{Rm}^3/\text{d}$	Voidage Replacement Ratio VRR
1989-01	1 028.6	21.7	6 318.9	1 080.0	7 398.9	6 414.8	984.1	31.7	0.87
1989-02	909.3	19.4	5 101.1	954.8	6 055.9	5 242.0	813.9	29.1	0.87
1989-03	1 067.7	22.3	5 955.1	1 121.1	7 076.2	6 104.3	971.9	31.4	0.86
1989-04	996.5	21.3	6 093.1	1 046.3	7 139.4	6 242.0	897.4	29.9	0.87
1989-05	771.8	16.0	4 943.7	810.4	5 754.1	635.0	5 119.1	165.1	0.11
1989-06	947.4	20.2	5 239.2	994.8	6 234.0	5 368.0	866.0	28.9	0.86
1989-07	1 061.3	22.6	6 001.0	1 114.4	7 115.4	6 175.0	940.4	30.3	0.87
1989-08	1 103.4	23.4	6 285.8	1 159.1	7 444.9	6 429.0	1 015.4	32.8	0.86
1989-09	1 006.5	21.4	6 116.7	1 056.8	7 173.5	6 209.0	964.5	32.2	0.87
1989-10	1 023.9	21.6	6 567.0	1 075.1	7 642.1	6 522.0	1 120.1	36.1	0.85
1989-11	994.6	20.8	6 162.6	1 044.3	7 206.9	6 267.0	939.9	31.3	0.87
1989-12	1 019.5	20.9	6 182.1	1 070.5	7 252.6	6 277.0	975.6	31.5	0.87
Totals	11 931.0	251.6	70 966.3	12 527.6	83 493.9	67 885.1	15 608.8	42.8	0.81

Cumulative Net Voidage From Commencement of Waterflood = 67 742.3  $\text{Rm}^3$   
Cumulative Field Net Voidage (1955-1989) = 351 171.1  $\text{Rm}^3$

TABLE 4  
DALY UNIT NO. 4  
1989 SUBSURFACE PRESSURE SURVEY RESULTS

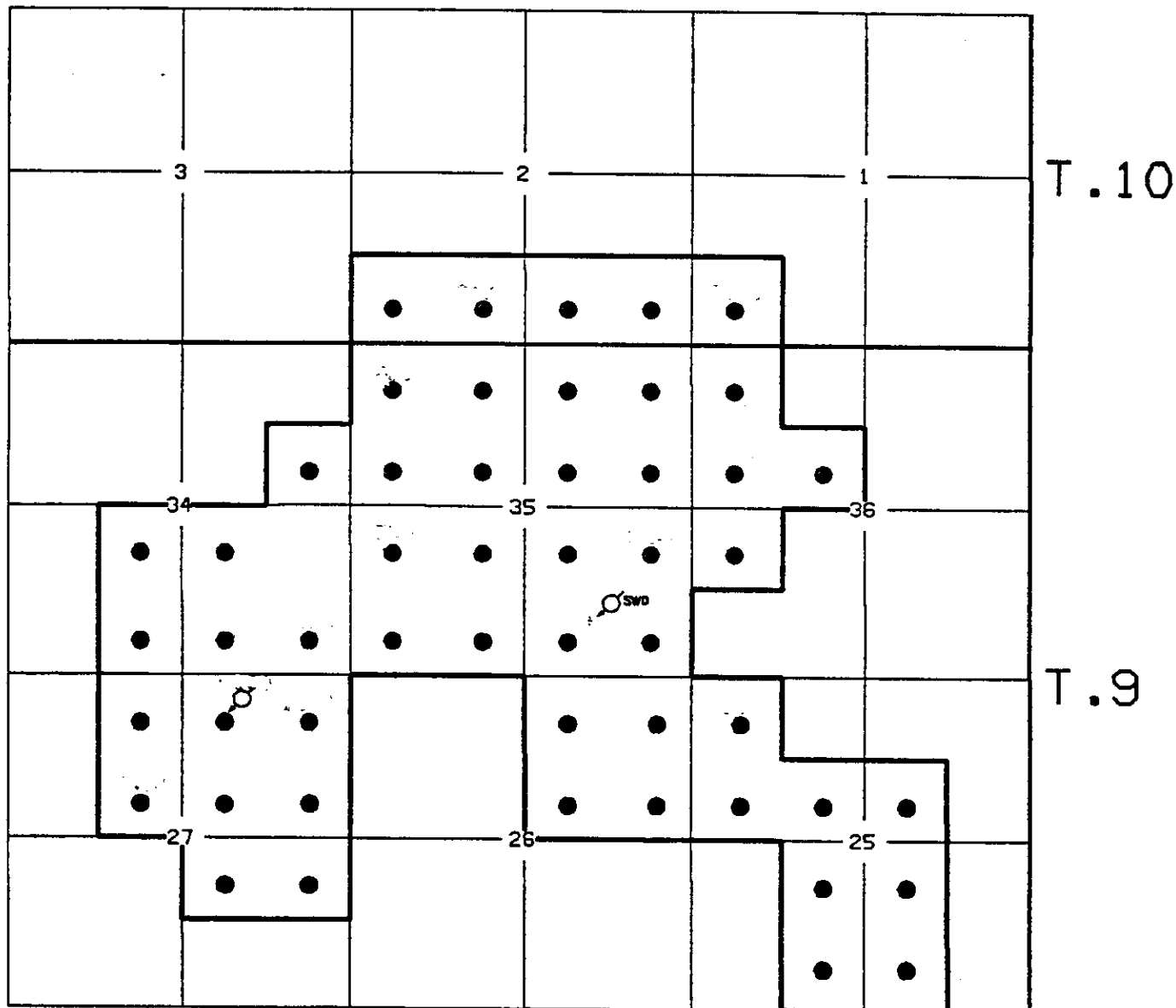
<u>Well</u>	<u>Survey Method</u>	<u>Datum Depth Pressure kPa</u>
07-25-09-28	SONOLOG	643
13-25-09-28	SONOLOG	937
10-26-09-28	SONOLOG	3 963
10-27-09-28	SONOLOG	8 279
15-27-09-28	SONOLOG	340
15D-27-09-28	SURFACE FALL-OFF	9 492
16-27-09-28	SONOLOG	1 130
01-34-09-28	SONOLOG	574
02-34-09-28	SONOLOG	600
* 01-35-09-28	SONOLOG	5 974
02-35-09-28	SONOLOG	6 379
05-35-09-28	SONOLOG	975
* 07-35-09-28	SONOLOG	8 448
08-35-09-28	SONOLOG	745
13-35-09-28	SONOLOG	439
12-36-09-28	SONOLOG	3 900
04-01-10-28	SONOLOG	9 100
03-02-10-28	SONOLOG	708
Arithmetic Average Pressure - kPa		3 479

\* Denotes suspended well.

FIGURE 1

DALY UNIT NO. 4  
AREA MAP

R.28WPM



● OIL WELL

⊘ INJECTION WELL

⊘<sub>swd</sub> DISPOSAL WELL

—— UNIT OUTLINE

# FIGURE 2 DALY UNIT NO. 4 PRODUCTION PLOT SUMMARY

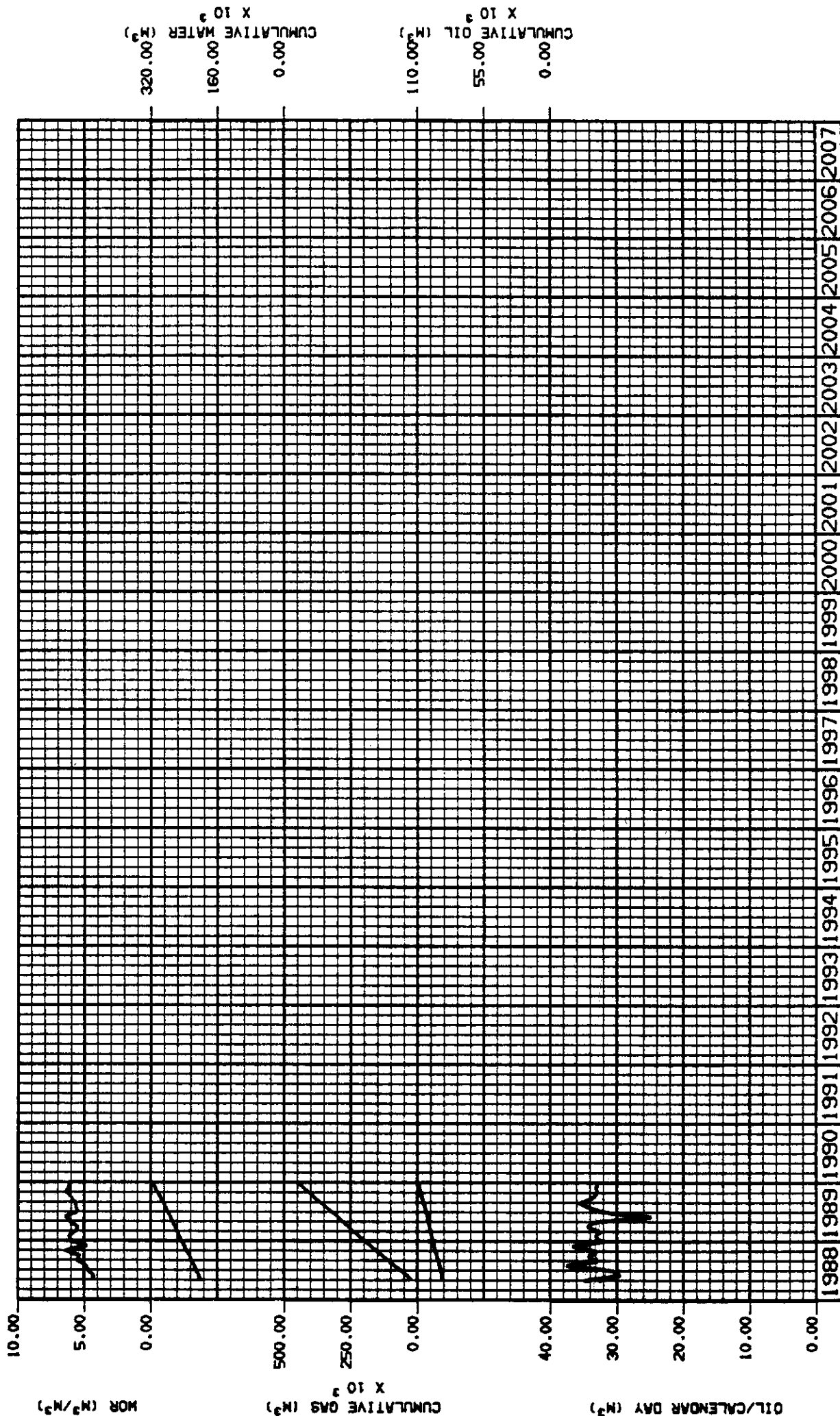
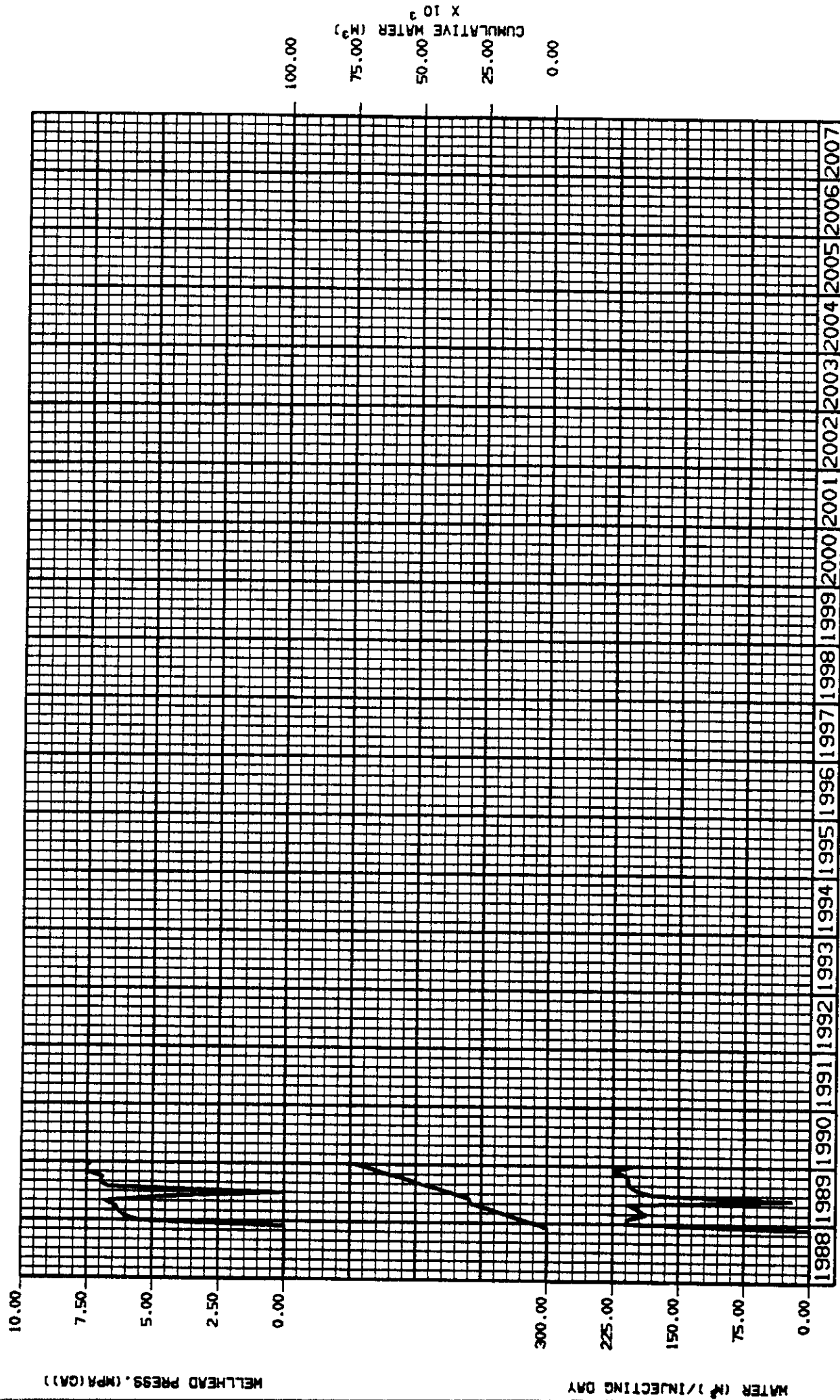


FIGURE 3

DAILY UNIT NO. 4

INJECTION PLOT

D 15-27-009-28W1



DATE