



Chevron Standard Limited
400 - Fifth Ave. S.W., Calgary, Alberta T2P 0L7

March 26, 1973

1762
North Virden Scallion Unit No. 1
Water Breakthrough and Performance
Review

Department of Mines, Resources
and Environmental Management
The Oil and Natural Gas Conservation Board
901 Norquay Building
401 York Avenue
Winnipeg, Manitoba
R3C 0P8

Attention: Mr. J. T. Cawley, P. Eng.
Chairman

Gentlemen:

As per our letter of April 27, 1972, water breakthrough was confirmed in the Phase II area of the North Virden Scallion Unit No. 1 waterflood. Following the successful detection of Devonian water utilizing the Atomic Absorption Spectrophotometer, Unit Operator undertook to sample and test produced water in all Phase II producing wells.

During May 1972, water samples were obtained on most producing wells in the Phase II area of the waterflood. Utilizing the AAS technique, outlined in the aforementioned letter, the Devonian water content of each produced water sample was determined. The results for the Phase II wells are reported and contoured on the attached map.

The ions selected for analysis were sodium, calcium and magnesium. From previous work these ions displayed a linear relationship in conjunction with the desired magnitude of concentrations in both base waters. From the analysis of each sample the percent Devonian water content was determined for each ion utilizing the correlation chart on the attached map. The Devonian water content of each sample was calculated by arithmetically averaging the content derived from each ion concentration.

It may be concluded that virtually all wells in the Phase II area have experienced water breakthrough. The identification of the breakthrough of Devonian water is only a qualitative measure of flood front advance in the Phase II area. This information cannot be quantified in terms of remaining recoverable reserves as the true breakthrough point in the waterflood history is unknown. Determination of breakthrough time by observing well performance is most difficult due to the presence of mobile Mississippian water.

A review of the predicted and actual performance of North Virden Scallion Unit No. 1 is as follows:

Original Oil-in-Place of Enlarged Unit	=	203,000,000 STB
Cumulative Production Pre Unit	=	11,854,536 STB
Unit to 12/31/72	=	<u>21,968,096 STB</u>
		33,822,632 STB
Recovery to Date (12/31/72)	=	16.6% of O.O.I.P.
Predicted Ultimate Recovery	=	28.4% of O.O.I.P.
		or 57,600,000 STB
Recovery Since Inception of Unit	=	21,968,096 STB
Oil-in-Place at Commencement of Flood	=	191,150,000 STB
% Recovery Since Commencement of Flood	=	11.5%
Current Water-Oil Ratio		1.5

Utilizing Table IV in the report "Reservoir Study - North Virden Scallion Field, Manitoba" submitted by Chevron Standard Limited and dated August 1961, the predicted recovery at a stock tank water-oil ratio of 1.5 was 11.7%. This indicates that the performance to date is as predicted. If aquifer water produced from the west flank unit wells is discounted, the current stock tank water-oil ratio is calculated to be 1.1. The predicted recovery at this water-oil ratio was estimated to be 9.1% of the oil-in-place at commencement of injection.

Chevron Standard Limited, as Operator of North Virden Scallion Unit No. 1, contends that the performance of the waterflood to date indicates that the ultimate recovery from the unit area will be as predicted. Unit Operator will continue to monitor the waterflood performance and if future production data indicates a significant variation in ultimate recovery in the unit, The Oil and Natural Gas Conservation Board will be so advised.

If there are any questions in regard to the foregoing, please contact Mr. G. W. Cruickshank at the above letterhead address.

Yours very truly,

G. W. Cruickshank P. ENG
for J. G. TROWELL
Division Manager
Producing Department
Calgary Division

WGCruickshank/lw
Attachments



MANITOBA

DEPARTMENT OF MINES, RESOURCES
& ENVIRONMENTAL MANAGEMENT

THE OIL AND NATURAL GAS CONSERVATION BOARD

901 NORQUAY BUILDING
401 YORK AVENUE
WINNIPEG 1
R3C 0P8

Jas. T. Cawley, P. Eng.

~~WOODRUFF~~ 946-7438
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J. S. ROPFR 946-7429

DEPUTY CHAIRMAN

M. J. GOBERT 946-7859
MEMBER

R. R. McDANIEL
CONSULTANT

DRAFT

April 17, 1973

Mr. J. G. Trowell
Division Manager
Producing Department
Chevron Standard Limited
400 Fifth Avenue S.W.
CALGARY, Alberta

Dear Mr. Trowell:

Re: North Virden Scallion Unit No. 1
Phase II Devonian Flood Fronts
Water Breakthrough and Performance Review

The above report of March 26, 1973 has been reviewed by the Board and it is noted that the percentage of Devonian water breakthrough varies throughout the area.

It is felt that certain areas of the reservoir may not be swept effectively unless careful planning is undertaken to provide a better balance in the overall injection plan.

The Board suggests, if reasonably possible, that Chevron Standard Limited, undertake a model study of the reservoir in order to provide more definitive information on the present injection scheme. It is felt such information could provide for variations in the mode of operation and effect increases in recoveries.

Yours very truly,

J. S. Roper
Deputy Chairman

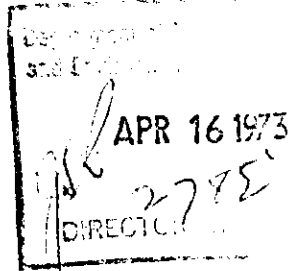
FSG/evh

MCDANIEL CONSULTANTS (1965) LTD.

Oil and Gas Reservoir Evaluations

R. R. MCDANIEL, P. ENG.
G. C. KNUTSON, P. ENG.
R. E. HUGHES, P. ENG.
W. C. SETH, P. ENG.
F. SCHORNING, P. GEOL.

800 WESTERN UNION BLDG
640 EIGHTH AVENUE S.W.
CALGARY, ALBERTA T2T 1G7
TELEPHONE (403) 262-5506



April 11, 1973

F.S.G.
Mr. J.S. Roper, Deputy Chairman,
The Oil and Natural Gas Conservation Board,
901 Norquay Building,
401 York Avenue,
Winnipeg, Manitoba,
R3C 0P8.

Dear Jack:

Further to your letter of April 2, with respect to the study of Devonian water breakthrough in the North Virden Scallion Unit No. 1, we have reviewed the report as supplied by Chevron Standard Limited.

As stated in our previous letter we would have anticipated water breakthrough to have occurred in essentially all of the wells. We note that Chevron Standard claim the performance characteristics of the Unit are close to their original predictions. Although on a cursory basis this would appear to be the case we do question that a more definitive study and in particular a model study might reveal somewhat different conclusions. It is noteworthy that the amount of breakthrough varies substantially throughout the area. As a result variations in the mode of operation might be considered. It is possible that certain areas of the reservoir will not be swept effectively unless careful planning is undertaken to provide a realistic balance in the overall injection plan. We would therefore suggest that if reasonably possible, Chevron Standard undertake a model study of the reservoir to obtain more definitive information on these factors. We believe that such a study might well provide information which could effect increases in recoveries over that of the present injection scheme.

Mr. J.S. Roper, Deputy Chairman

Page 2

We trust that these brief comments will be of assistance to you in assessing the performance of this reservoir, however, should there be any additional questions please do not hesitate to contact the writer.

Sincerely,

McDANIEL CONSULTANTS (1965) LTD.

A handwritten signature in dark ink, appearing to read 'R.R. McDaniel', is written over a horizontal line.

R.R. McDaniel, P. Eng.

RRMcD:nfw



Chevron Standard Limited

400 - Fifth Ave. S.W., Calgary, Alberta T2P 0L7

March 26, 1973

1763

North Virden Scallion Unit No. 1 Water Breakthrough and Performance Review

Department of Mines, Resources
and Environmental Management
The Oil and Natural Gas Conservation Board
901 Norquay Building
401 York Avenue
Winnipeg, Manitoba
R3C 0P8

Attention: Mr. J. T. Cawley, P. Eng.
Chairman

Gentlemen:

As per our letter of April 27, 1972, water breakthrough was confirmed in the Phase II area of the North Virden Scallion Unit No. 1 waterflood. Following the successful detection of Devonian water utilizing the Atomic Absorption Spectrophotometer, Unit Operator undertook to sample and test produced water in all Phase II producing wells.

During May 1972, water samples were obtained on most producing wells in the Phase II area of the waterflood. Utilizing the AAS technique, outlined in the aforementioned letter, the Devonian water content of each produced water sample was determined. The results for the Phase II wells are reported and contoured on the attached map.

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It may be concluded that virtually all wells in the Phase II area have experienced water breakthrough. The identification of the breakthrough of Devonian water is only a qualitative measure of flood front advance in the Phase II area. This information cannot be quantified in terms of remaining recoverable reserves as the true breakthrough point in the waterflood history is unknown. Determination of breakthrough time by observing well performance is most difficult due to the presence of mobile Mississippian water.

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or 57,600,000 STB

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Current Water-Oil Ratio 1.5

Utilizing Table IV in the report "Reservoir Study - North Virden Scallion Field, Manitoba" submitted by Chevron Standard Limited and dated August 1961, the predicted recovery at a stock tank water-oil ratio of 1.5 was 11.7%. This indicates that the performance to date is as predicted. If aquifer water produced from the west flank unit wells is discounted, the current stock tank water-oil ratio is calculated to be 1.1. The predicted recovery at this water-oil ratio was estimated to be 9.1% of the oil-in-place at commencement of injection.

Chevron Standard Limited, as Operator of North Virden Scallion Unit No. 1, contends that the performance of the waterflood to date indicates that the ultimate recovery from the unit area will be as predicted. Unit Operator will continue to monitor the waterflood performance and if future production data indicates a significant variation in ultimate recovery in the unit, The Oil and Natural Gas Conservation Board will be so advised.

If there are any questions in regard to the foregoing, please contact Mr. G. W. Cruickshank at the above letterhead address.

Yours very truly,

G. W. Cruickshank P. Eng
J. G. TROWELL
Division Manager
Producing Department
Calgary Division

GWCruickshank/lw
Attachments



Chevron Standard Limited

400 - Fifth Ave. S.W., Calgary, Alberta T2P 0L7

March 26, 1973

1762



Department of Mines, Resources
and Environmental Management
The Oil and Natural Gas Conservation Board
901 Norquay Building
401 York Avenue
Winnipeg, Manitoba
R3C 0P8

Attention: Mr. J. T. Cavley, P. Eng.
Chairman

Gentlemen:

Attached are three (3) copies of a report on Water Breakthrough and
Performance of the secondary recovery scheme in North Virden Scallion
Unit No. 1.

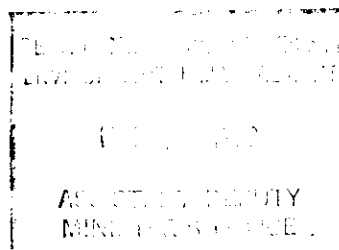
Yours very truly,

G. Cruickshank P. Eng.

J. G. TROWELL
Division Manager
Producing Department
Calgary Division

GWCruickshank/lw
Attachments

spec. to J. T. Cavley



MCDANIEL CONSULTANTS (1965) LTD.

Oil and Gas Reservoir Evaluations

R. R. MCDANIEL, P. ENG.
G. C. KNUTSON, P. ENG.
R. E. HUGHES, P. ENG.
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F. SCHORNING, P. ENG.

800 WESTERN UNION BLDG.
640 EIGHTH AVENUE S.W.
CALGARY 2, ALBERTA
TELEPHONE (403) 262-5506

May 9, 1972

*FSG
Please prepare an acknowledgment
of this paper a letter to
H. Roper for my signature
May 11/72*

Mr. J. S. Roper,
Deputy Chairman,
Department of Mines, Resources
& Environmental Management,
The Oil and Natural Gas Conservation Board,
901 Norquay Building,
401 York Avenue,
Winnipeg, Manitoba.
R3C 0P8

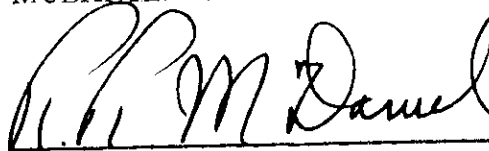
Dear Mr. Roper:

In regard to your letter of May 2, 1972 which referred to the Devonian water breakthrough in the North Virden Scallion Unit No. 1, we would expect that some such occurrence should be anticipated. Chevron Standard have probably performed detailed model studies on this field which would provide a much better appraisal of the performance characteristics with water breakthrough at this time. As a result, it is suggested that they be approached with a view to obtain their appraisal of the performance of this water injection scheme and the relationship of performance characteristics to date on ultimate recoveries.

Sincerely,

MCDANIEL CONSULTANTS (1965) LTD.

11 to
BF. May 18/72
St. H.



R. R. McDaniel, P. Eng.

RRMcD:lh

*see to 12.12.12 May 11/72 to make
of H*

MCDANIEL CONSULTANTS (1965) LTD.

Oil and Gas Reservoir Evaluations

R. R. McDANIEL, P. ENG.
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800 WESTERN UNION BLDG.
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May 9, 1972

FSG
© Please prepare an acknowledgment
© Please prepare a letter to J. S. Roper
May 11/72

Mr. J. S. Roper,
Deputy Chairman,
Department of Mines, Resources
& Environmental Management,
The Oil and Natural Gas Conservation Board,
901 Norquay Building,
401 York Avenue,
Winnipeg, Manitoba.
R3C 0P8

Dear Mr. Roper:

Pursuant to your request we have reviewed the Progress Reports on the Whitewater Unit No. 1, the North Virden Scallion Unit No. 1, the Routledge Unit No. 1 and the Virden Roselea Unit No. 3.

It would appear that the performance characteristics of these unitized areas are following more or less anticipated patterns. It is to be pointed out however that significant variations in the ultimate recoveries in the various areas will probably occur because of the varying amounts of water production and the trend in the oil producing rates. It would certainly be of interest to obtain more detailed appraisals of these factors and the projected ultimate recoveries from the operator.

Should it be possible to obtain such information, the writer would be most pleased to assist in the review of same.

Sincerely,

MCDANIEL CONSULTANTS (1965) LTD.

per to Mr. Roper
1. 2818

R.R.M. Daniel
R. R. McDaniel, P. Eng.

RRMcD:1hh



Chevron Standard Limited

400 Fifth Avenue S.W., Calgary 1, Alberta

April 27, 1972

North Virden Scallion Unit No. 1
Water Breakthrough

The Oil and Natural Gas Conservation Board
Box 42
Legislative Building
Winnipeg 1, Manitoba

Attention: Mr. Winston Mair, Chairman

Gentlemen:

In accordance with Pressure Maintenance Rule (3) of Order No. PM 1, Chevron Standard Limited as operator of North Virden Scallion Unit No. 1, hereby submits that water breakthrough has been confirmed in the subject Unit.

Water compositions determined by the AAS technique (Atomic Absorption Spectrophotometer) have confirmed the presence of Devonian water in produced water from the Phase II area of the Unit. Previous attempts to establish breakthrough by performance were not definitive. Water-oil ratio trends of Unit producers have not been unlike those of non-unit wells in the adjacent west flank area. A tracer chemical (ammonium thiocyanate) was injected into nineteen selected injectors in 1964. Produced water samples to date have not indicated the presence of the tracer.

The AAS technique provides concentrations of various trace ions in water samples. Compositions of Devonian source water and uncontaminated Mississippian produced water were determined utilizing the above technique. Subsequent water samples taken from Phase II producers were analysed to determine concentrations of trace ions. The test results are summarized in Table I. Figure I illustrates that the Devonian water (breakthrough water) content in the four Phase II wells sampled is in the order of 50 percent. Only trace ions with apparent linear relationships were utilized.

Water samples will be obtained on most Phase II wells in the subject Unit. From the analysis of these samples it will be possible to estimate the amount of breakthrough water present in the Phase II producers. These results will be forwarded when they become available.

Yours very truly,

G. W. Cruickshank P.E.N.C.

for

J. G. TROWELL
Division Manager
Producing Department
Calgary Division

G.W. Cruickshank/bv
Attachs.

TABLE I

WATER ANALYSIS - AAS TECHNIQUE

NORTH VIRDEN SCALLION UNIT NO. 1

<u>Sample Location</u>	<u>Source</u>	<u>Water Composition - Concentration in PPM</u>								
		<u>Na</u>	<u>K</u>	<u>Li</u>	<u>Rb</u>	<u>Ca</u>	<u>Mg</u>	<u>Sr</u>	<u>Ba**</u>	<u>Total Ion*</u>
13-17-11-26 WPM	Miss.	16,800	303	3.4	0.6	1310	517	33	46 ✓	51,000
14-16-11-26 WPM	Miss.	16,450	304	3.4	0.5	1330	520	33	46	52,000
WSW 6-27-11-26	Devonian	75,600	2020	7.3	3.5	3580	1130	73	71	190,000
WSW 6-27-11-26	Devonian	77,600	2060	7.3	3.1	3420	1140	74	76	200,000
15-4-12-26)	Phase	45,500	405	4.0	0.7	2350	800	47	45	135,000
9-23-11-26)	II	50,600	415	4.0	0.7	2400	810	44	75	145,000
15-23-11-26)	Produced	49,900	417	4.2	0.7	2400	810	45	47	145,000
11-13-11-26)	Water	53,200	410	3.8	0.7	2380	860	45	39	160,000

* Determined from resistivity measurements.

** Barium precision ± 20 percent.

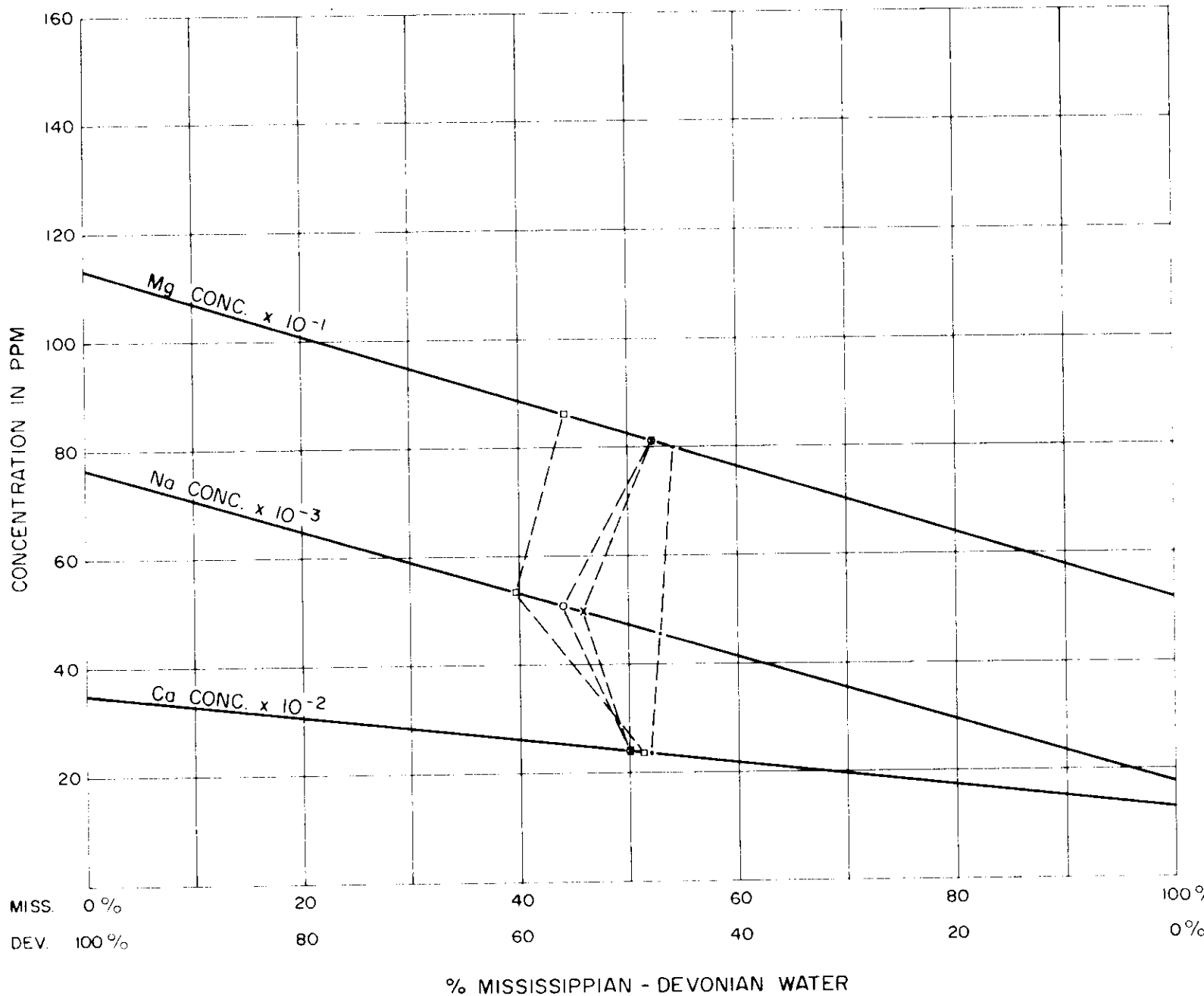
Mn and Cr concentrations were determined to be less than 0.5 ppm.

FIGURE 1

NORTH VIRDEN SCALLION UNIT No. 1

TRACE ION CONCENTRATIONS

PHASE II AREA



WELLS SAMPLED

- 15 - 4 - 12 - 26
- 11 - 13 - 11 - 26
- x 9 - 23 - 11 - 26
- 15 - 23 - 11 - 26

TP. 12

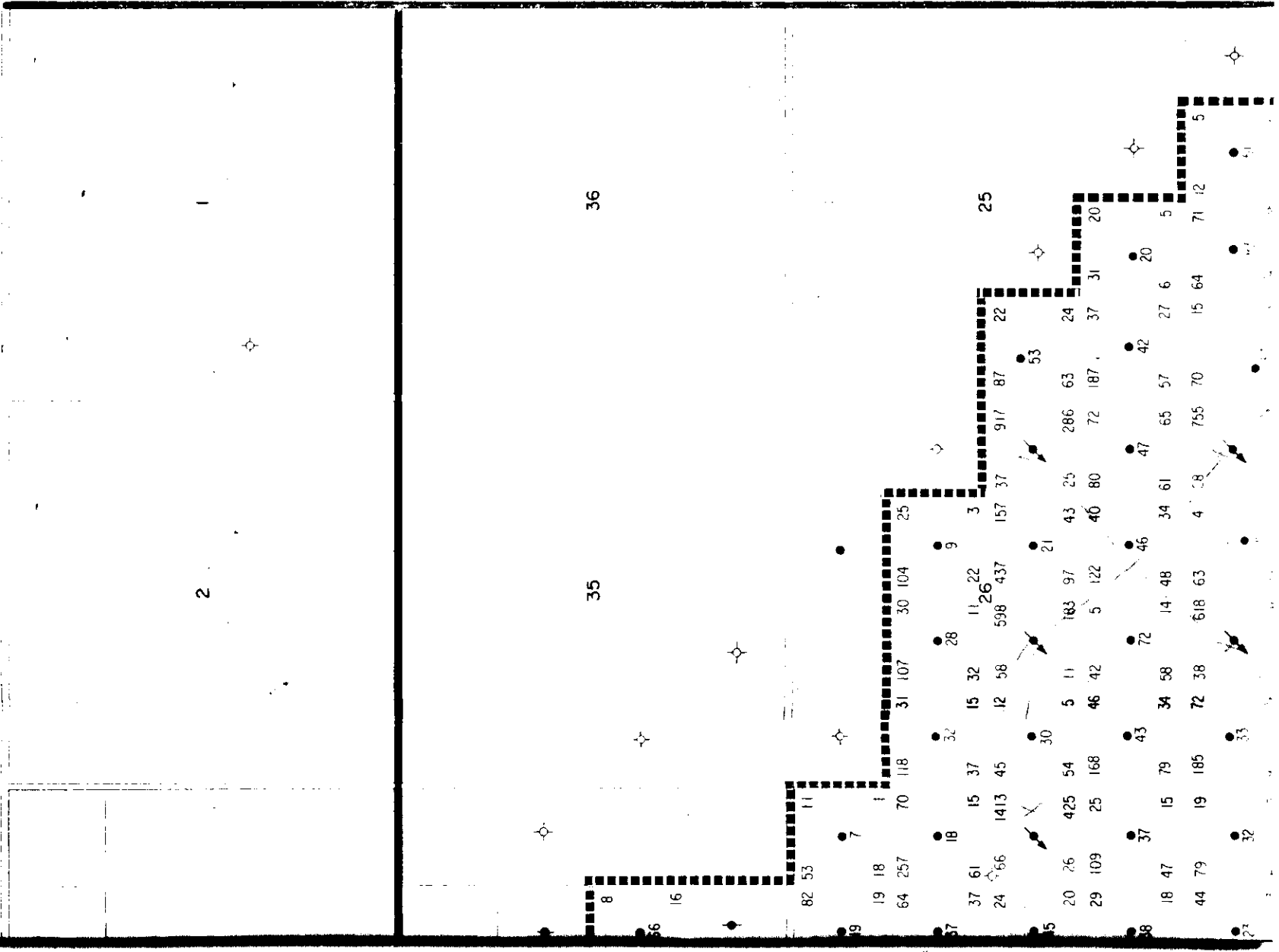
31

23

30

29

Тр. 12



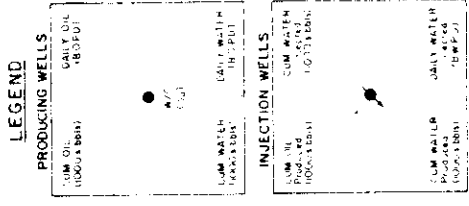
Tp. 11

Dept. Mines, Resources and
Environmental Management

FEB 28 1972

PETROLEUM ENGINEERING
DIVISION

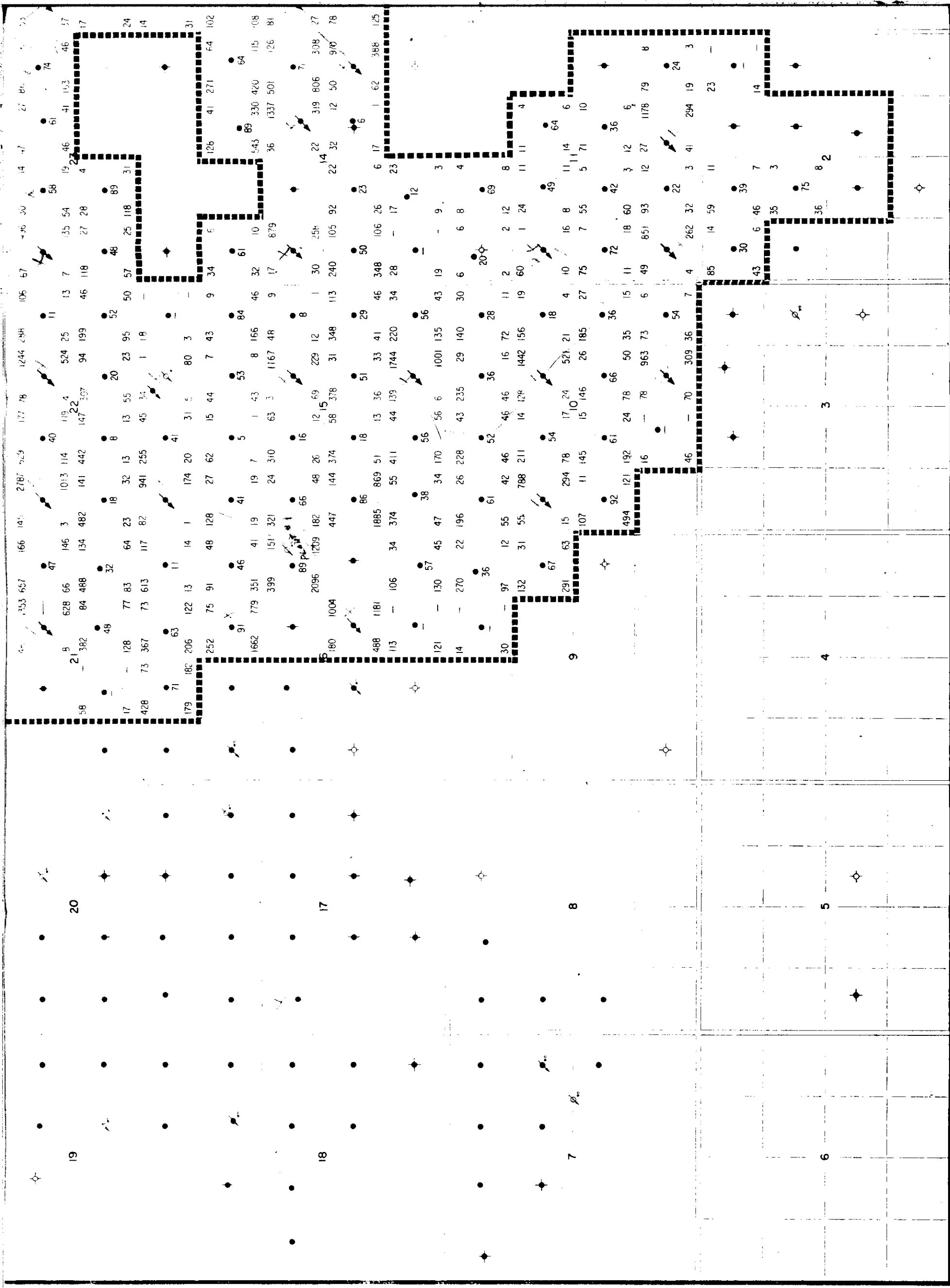
NOTE:
CURRENT FIGURE ARE FOR NOVEMBER 1971
CUMULATIVE FIGURES AS OF NOVEMBER 30, 1971



REVISIONS		DATE	BY	APP.
1		MAY 21, 1963		
CHEVRON STANDARD LIMITED		UNIT No. 1		
NORTH VIRDEN-SCALLION AREA		SUMMARY OF CURRENT AND CUMULATIVE PRODUCTION AND INJECTION STATISTICS		
SCALE 1 INCH = 1000 FT.		F-9608-3		

Rge. 26 W.P.M.

Тр. II



Rge. 26 W.P.M.

Topographic map showing a section of the Assiniboine River and surrounding land. The river is labeled "ASSINIBOINE" and flows from the top left towards the bottom right. A large area of land is outlined with a thick black border, possibly indicating a specific land parcel or survey area. Numerous numerical values are scattered across the map, likely representing elevation or survey data. The map is oriented with North at the top.

NOTE.
CURRENT FIGURES ARE FOR NOVEMBER 1971
CUMULATIVE FIGURES AS OF NOVEMBER 30, 1971

PETROLEUM ENGINEERING DIVISION

PRODUCING WELLS

CUM OIL	DAILY Oil
(KOD's bbis)	(B u P L)

•
C
u/Δ)

CUM WATER (000s bbls)	DAILY WATER (BOPD)
100	100
200	200
300	300
400	400
500	500
600	600
700	700
800	800
900	900
1000	1000
1100	1100
1200	1200
1300	1300
1400	1400
1500	1500
1600	1600
1700	1700
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8200	8200
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8700	8700
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8900	8900
9000	9000
9100	9100
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9700	9700
9800	9800
9900	9900
10000	10000

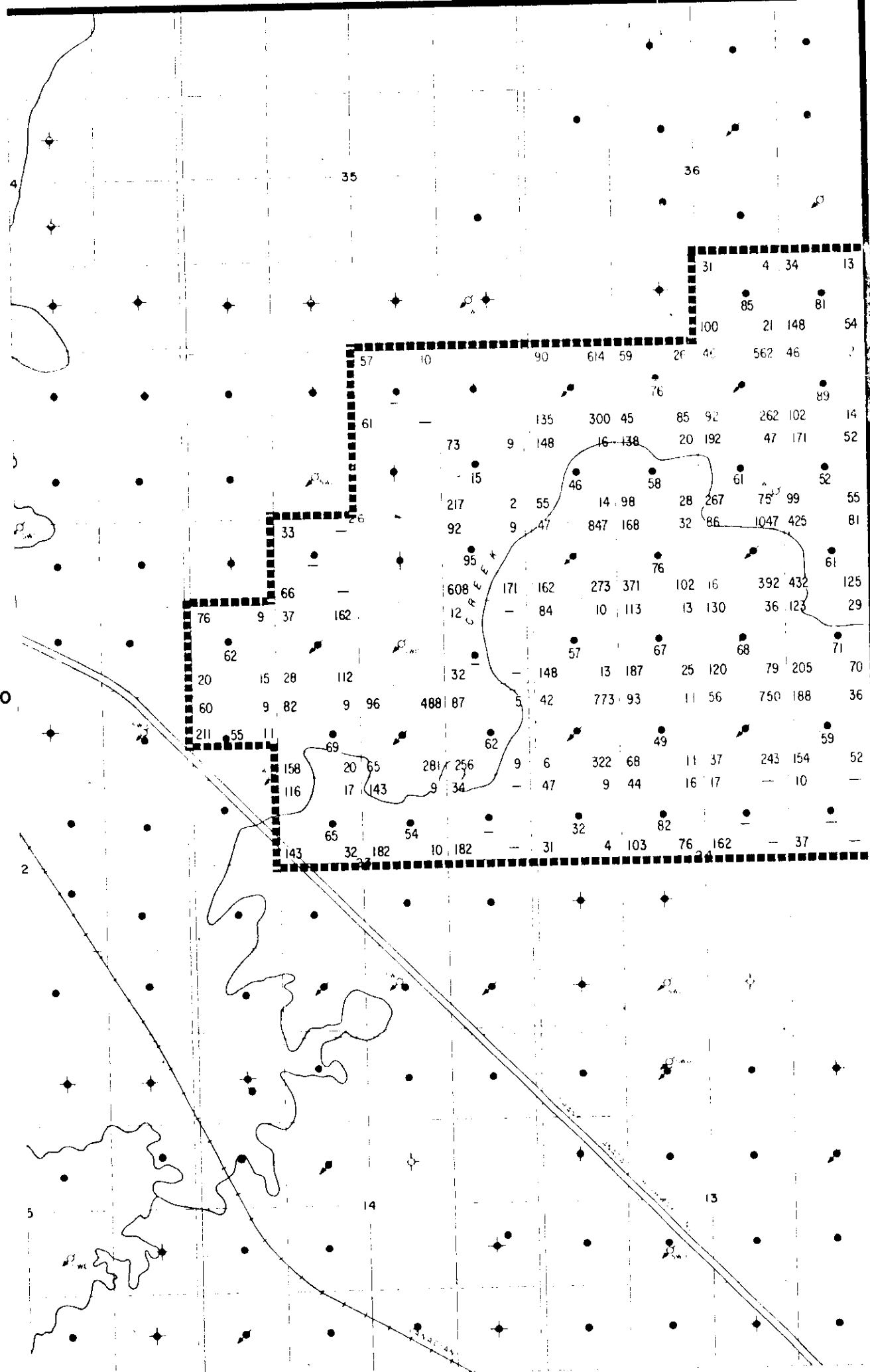
INJECTION WELLS	
CUM OIL Produced (1000's bbls)	CUM WATER Injected (1000's bbls)

CUM WATER Produced (m)GGS/bbls)	DAILY WATER Injected (M)GGS/D
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
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96	96
97	97
98	98
99	99
100	100

REVISIONS	CHEVRON STANDARD LIMITED		
	VIRDEN - ROSELEA AREA		
	UNIT No. 1		
	SUMMARY OF CURRENT AND CUMULATIVE PRODUCTION AND INJECTION STATISTICS		
	SCALE	DATE	DRAWN
	1 INCH = 200 FEET	JULY 1969	B-9831

T. 10

R. 26

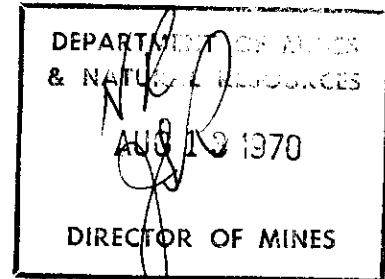




CHEVRON STANDARD LIMITED

400 FIFTH AVENUE S.W., CALGARY 1, ALBERTA

August 11, 1970



Department of Mines and Natural Resources
1010 Norquay Building
401 York Avenue
Winnipeg 1, Manitoba

Attention: Mr. M. J. Gobert

Gentlemen:

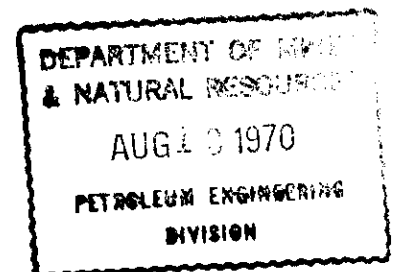
The attached maps, showing the production and injection for Virden-Roselea Unit Nos. 1, 2 and 3 and North Virden-Scallion Unit No. 1, indicate the reservoir voidage status on May 31, 1970.

If you have any questions with respect to the attached, please contact the undersigned.

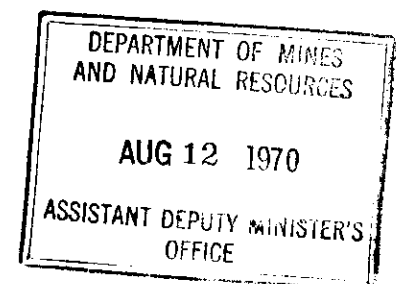
Yours very truly,

for *Flisio*

J. G. TROWELL
Division Superintendent
Producing Department
Calgary Division

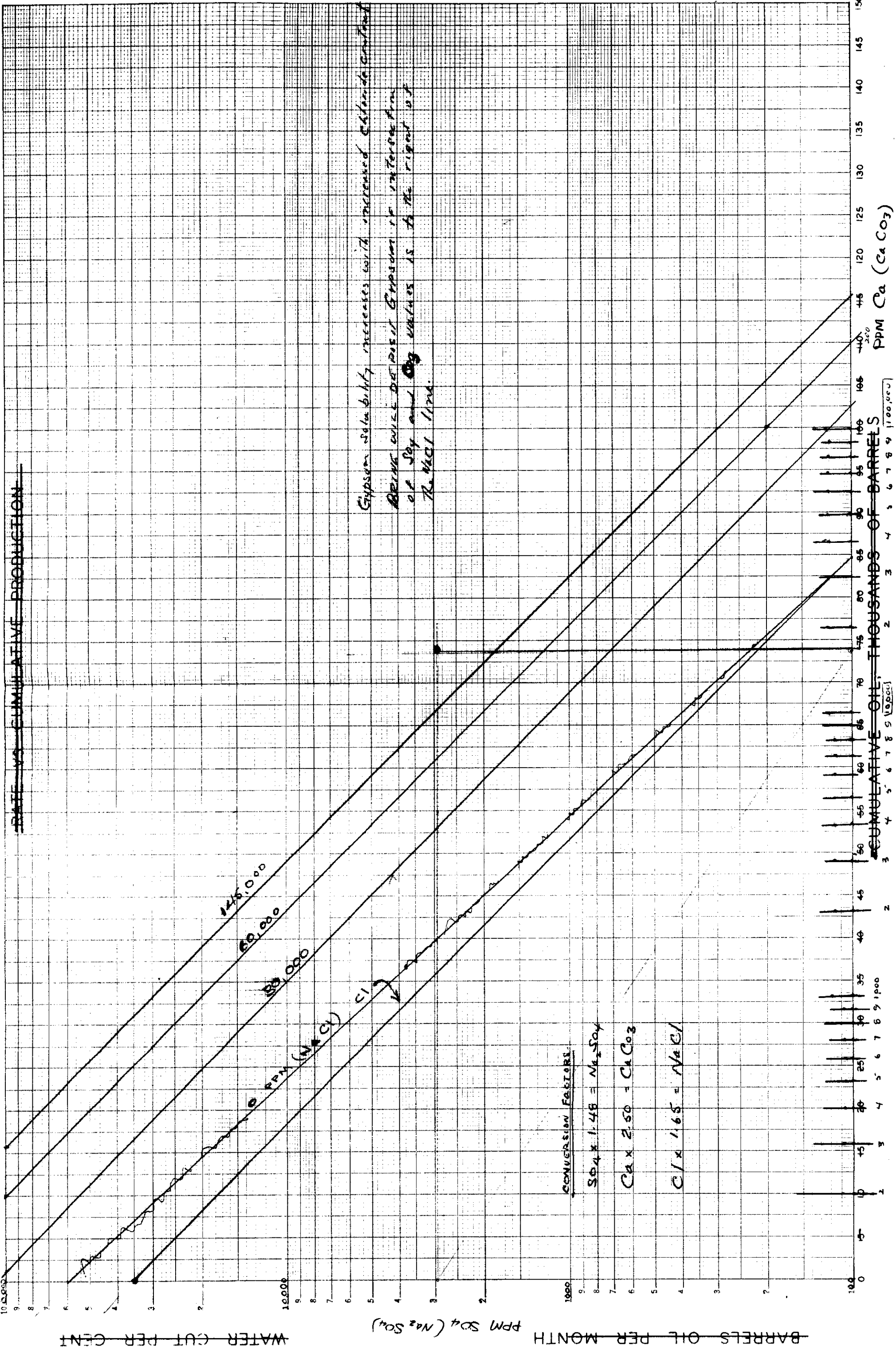


PP/cs
Attachments

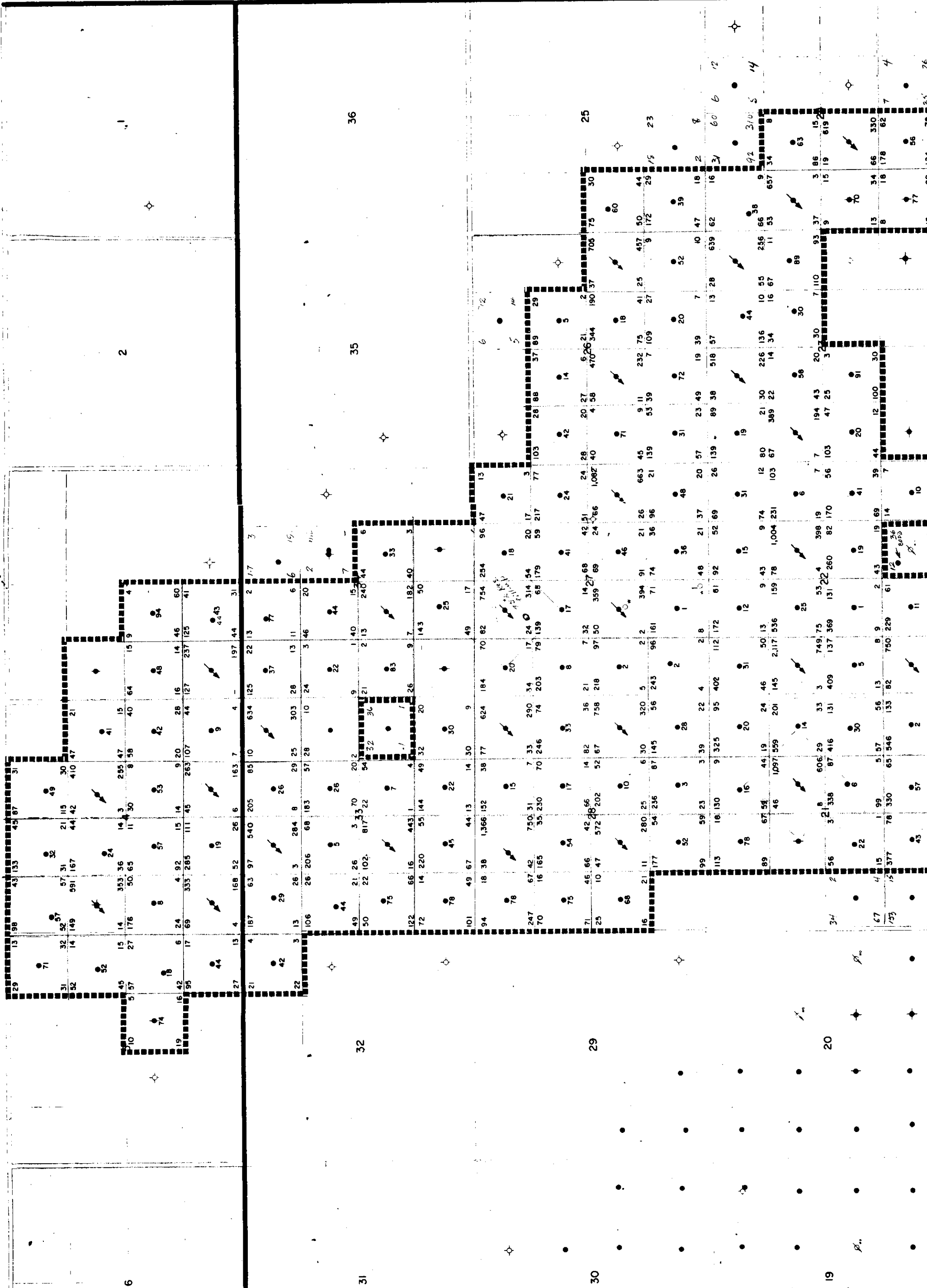


GYPSUM SOLUBILITY CURVE

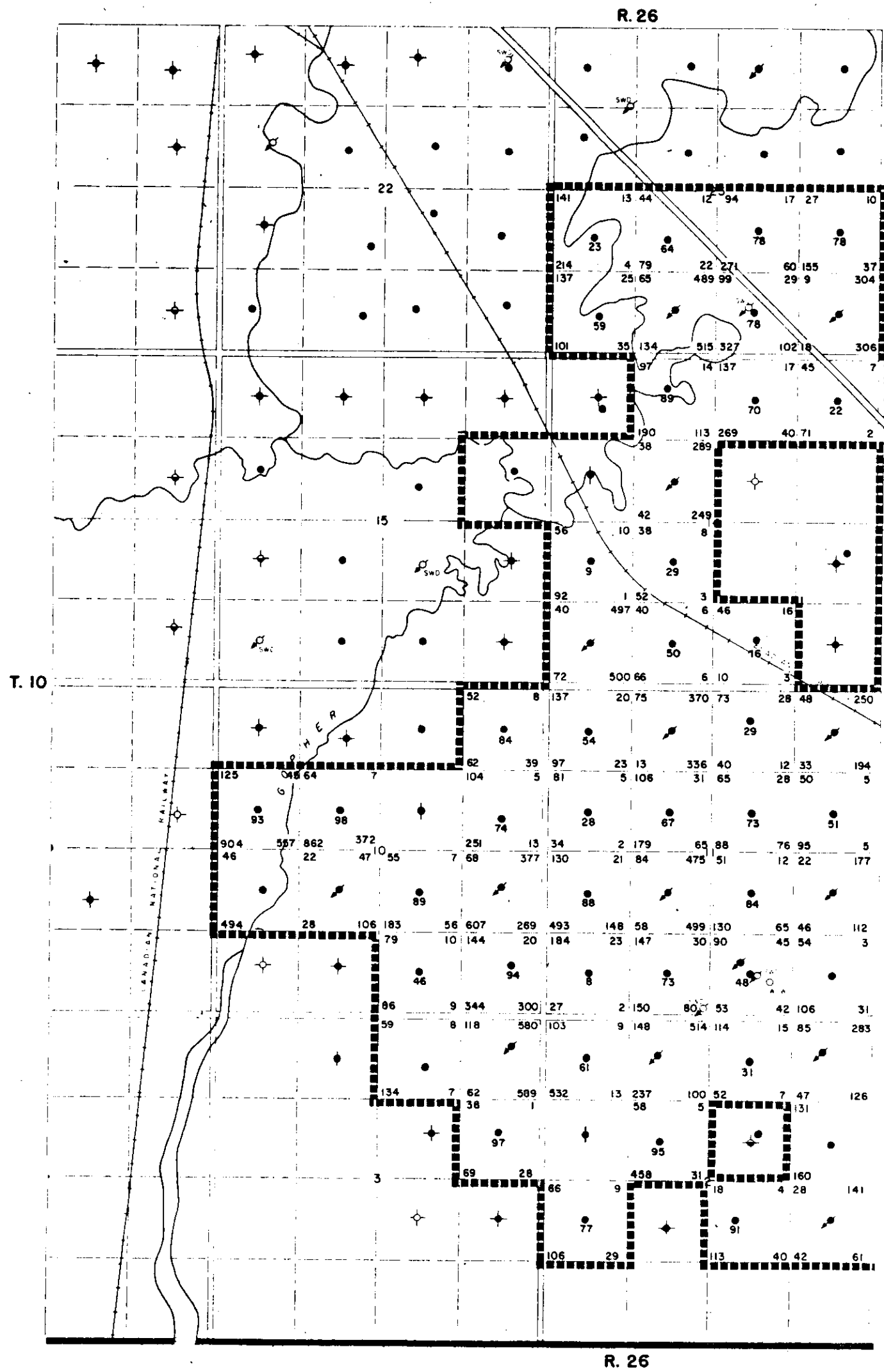
LIC.



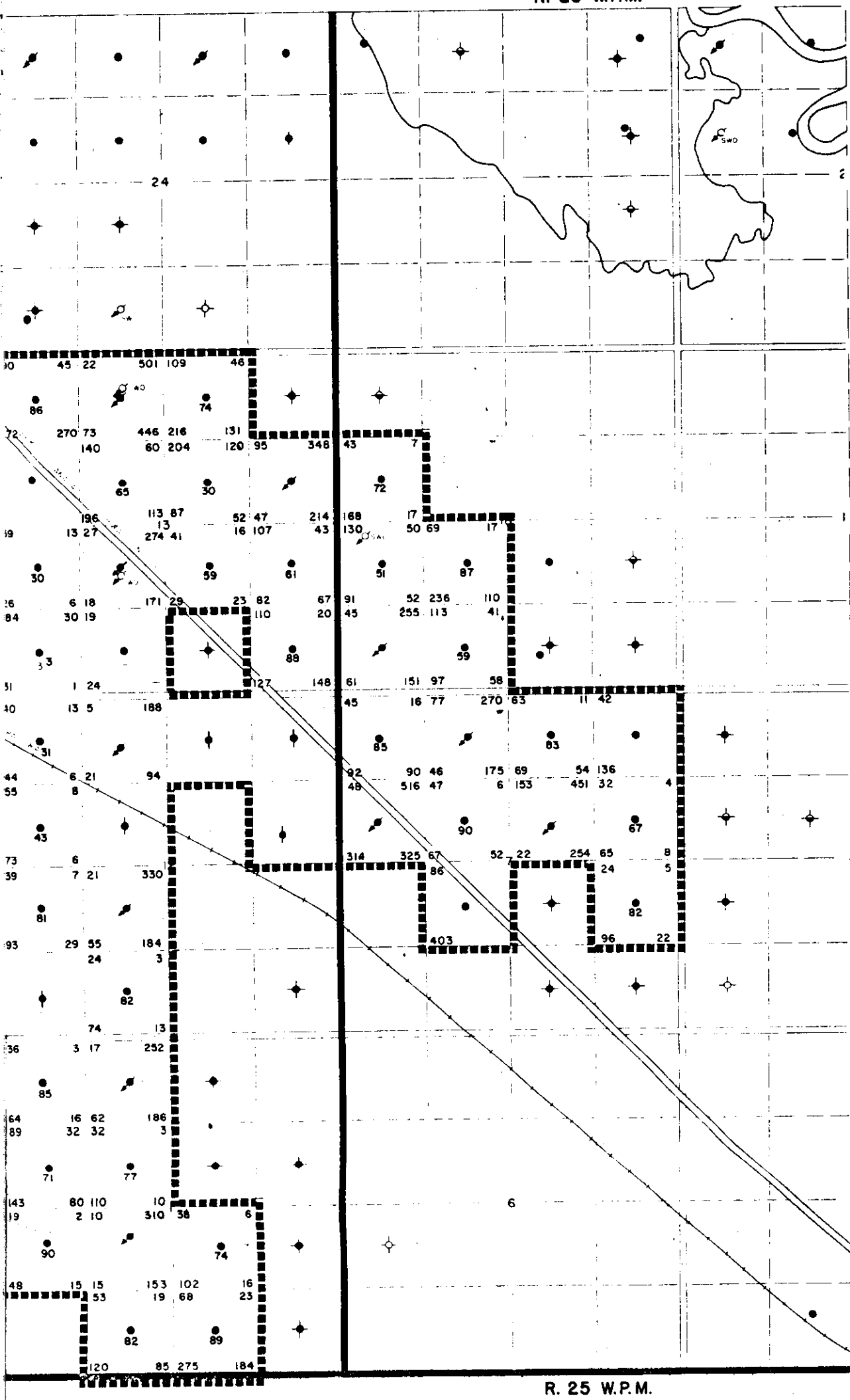
Rge. 26 W.P.M.



Rge. 26 W.P.M.



R. 25 W.P.M.



T. 10

R. 25 W.P.M.

LEGEND

PRODUCING WELLS

CUM. OIL (000 bbl) DAILY OIL (30 bbl)

CUM. WATER (000 bbl) DAILY WATER (100 bbl)

CUM. OIL (000 bbl) DAILY OIL (30 bbl)

CUM. WATER (000 bbl) DAILY WATER (100 bbl)

INJECTION WELLS

CUM. OIL (000 bbl) DAILY OIL (30 bbl)

CUM. WATER (000 bbl) DAILY WATER (100 bbl)

CUM. OIL (000 bbl) DAILY OIL (30 bbl)

CUM. WATER (000 bbl) DAILY WATER (100 bbl)

CUM. OIL (000 bbl) DAILY OIL (30 bbl)

CUM. WATER (000 bbl) DAILY WATER (100 bbl)

NOTE:
CURRENT FIGURES ARE FOR MAY 1970
CUMULATIVE FIGURES AS OF MAY 31, 1970

CHEVRON STANDARD LIMITED

VIRDEN - ROSELEA AREA

UNIT No. 3

SUMMARY OF CURRENT
AND
CUMULATIVE PRODUCTION
AND
INJECTION STATISTICS

SCALE

DATE

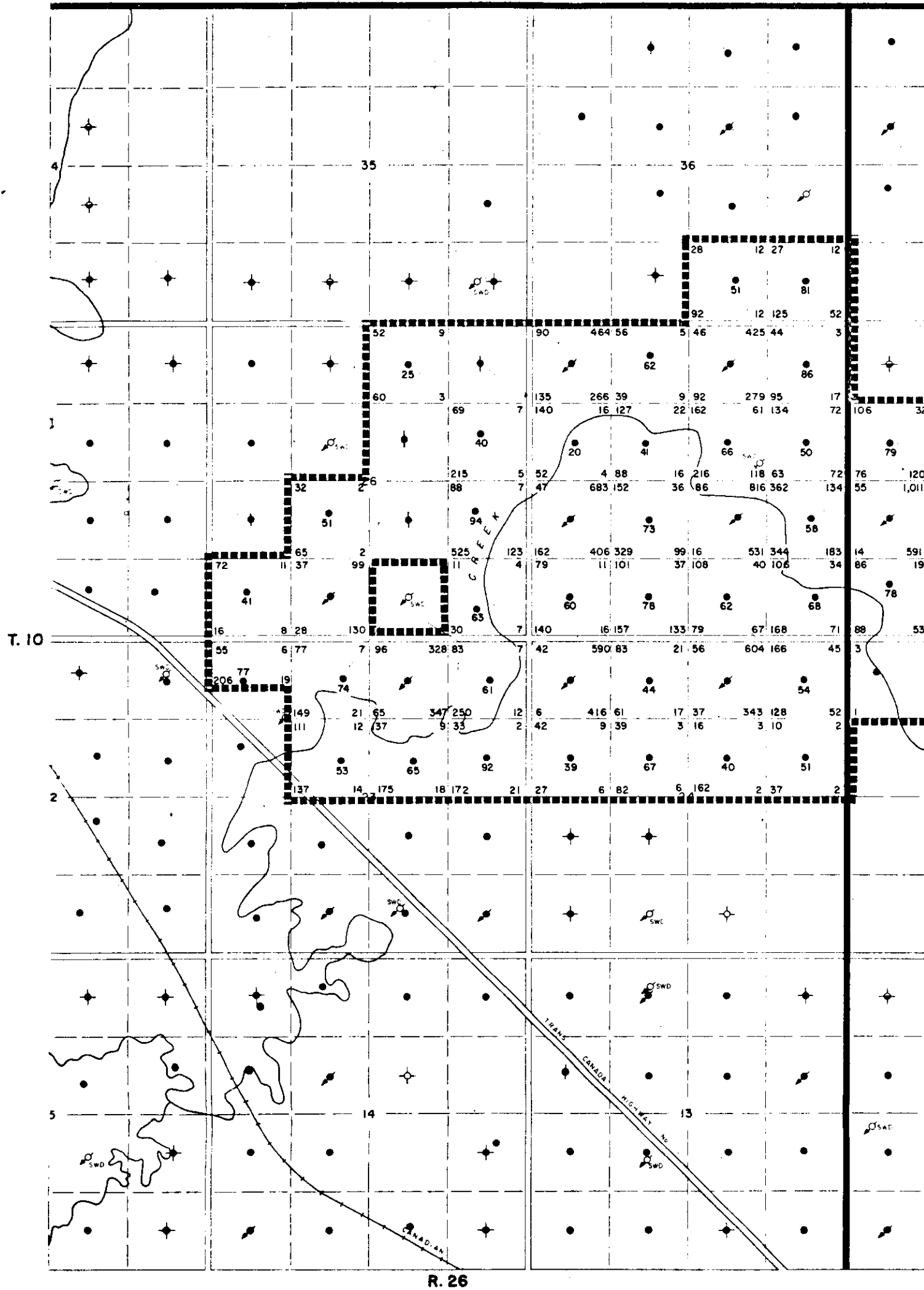
DRAWN

1 INCH = 1000 FT.

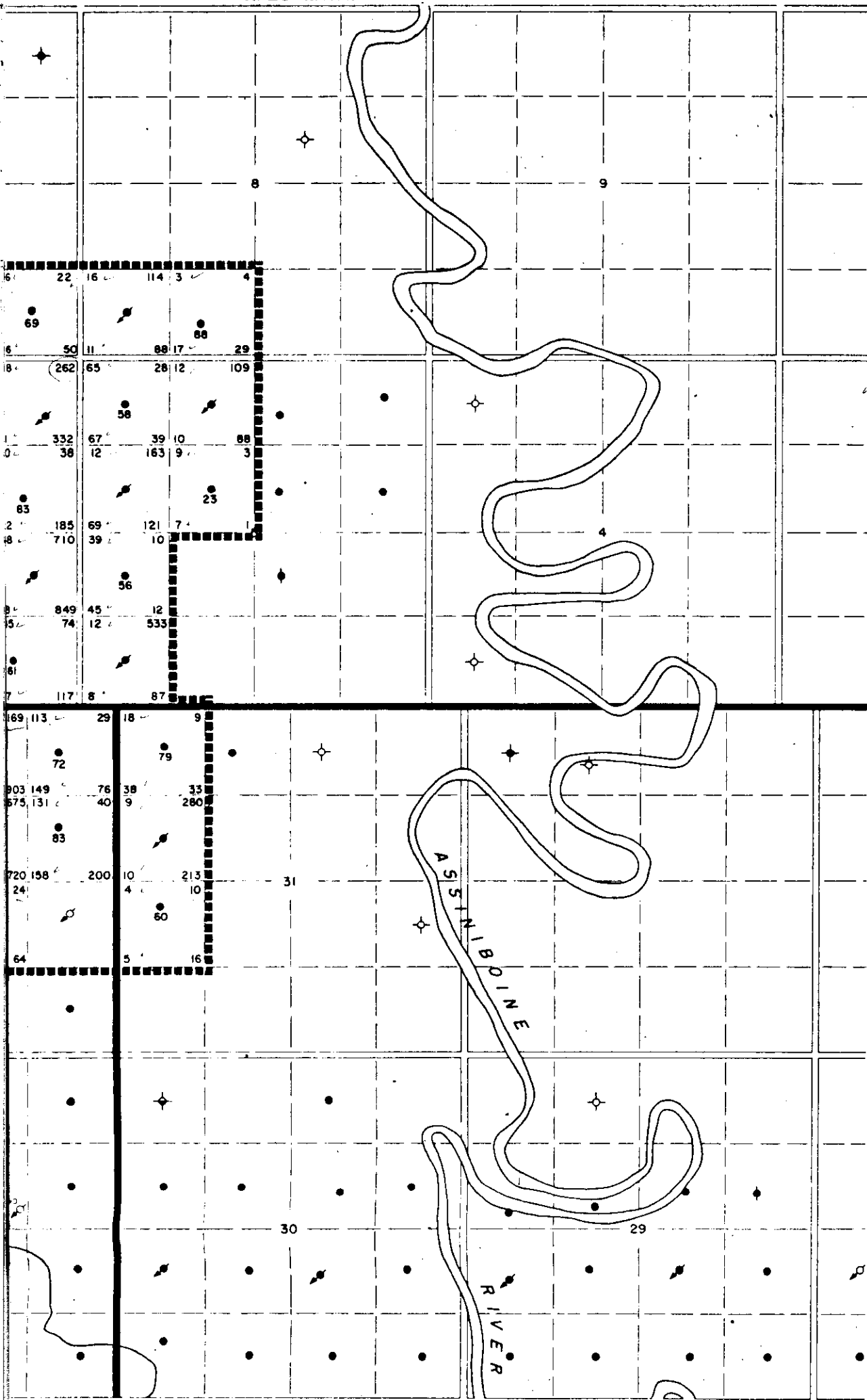
JULY 1969

B-9833

R. 26



R. 25 W.P.M.



Section 16 5972
8. 1000
67000
1000 1000 1000

400 6000
1000
1000 1000

T. 11

1000 2000 1000 1000

T. 10

R. 25 W.P.M.

LEGEND

PRODUCING WELLS

CUM OIL (1000 bbls)	DAILY OIL (BOPD)
W/C (%)	
CUM WATER (1000 bbls)	DAILY WATER (BOPD)

INJECTION WELLS

CUM OIL Produced (1000 bbls)	CUM WATER Injected (1000 bbls)
CUM WATER Produced (1000 bbls)	DAILY WATER Injected (BOPD)

REVISIONS

CHEVRON STANDARD LIMITED

VIRDEN - ROSELEA AREA

UNIT No. 2

SUMMARY OF CURRENT
AND
CUMULATIVE PRODUCTION
AND
INJECTION STATISTICS

SCALE

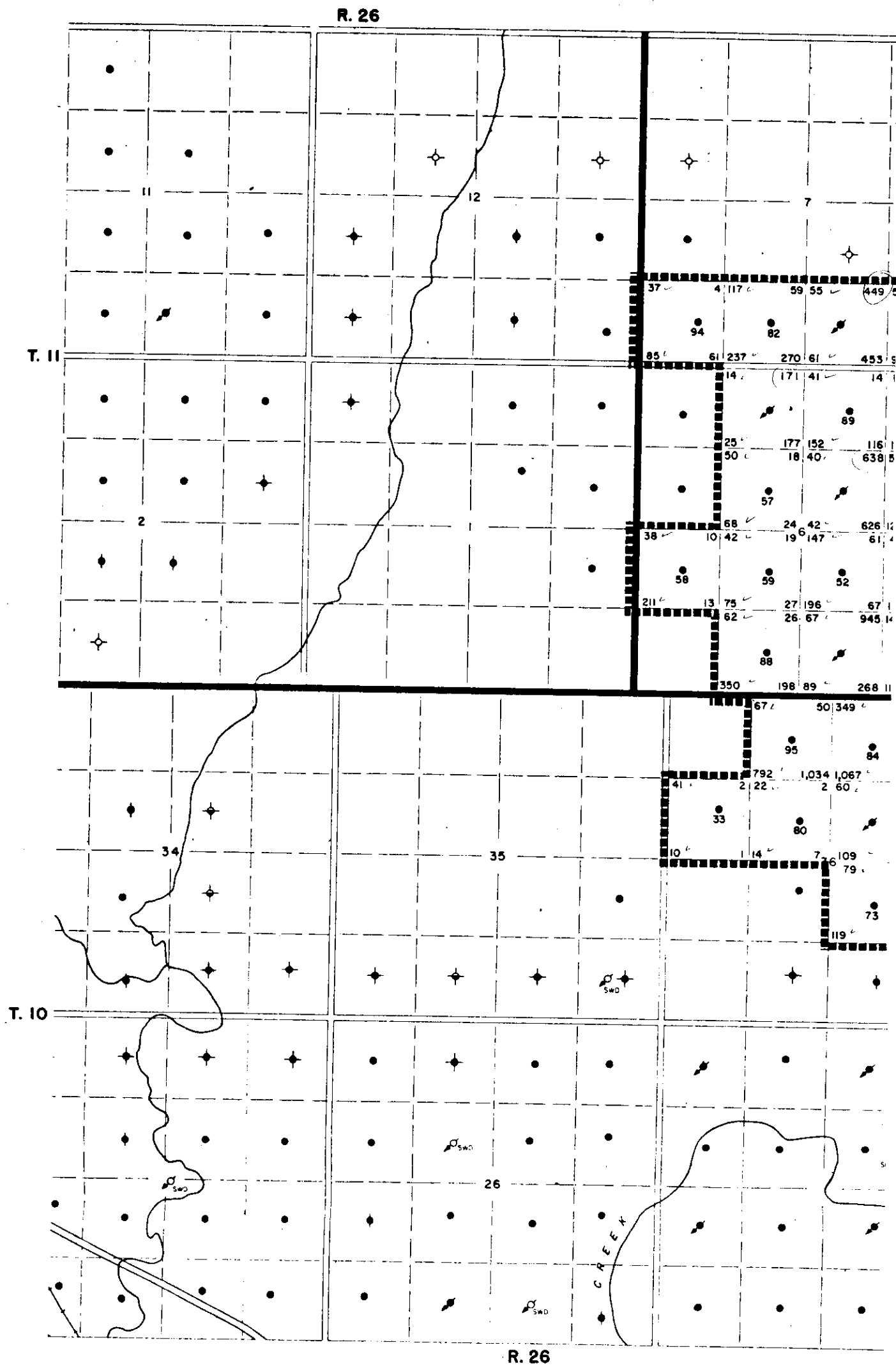
DATE

DRAWN

1 INCH = 1000 FT

JULY 1969

B-9832



WORTH FIELD MISSISSIPPIAN UNIT # 2

PRODUCTION REPORT - MONTH OF DECEMBER 1972

SYNOPSIS

This report represents a brief summary of operations for the month of December 1972.

OPERATIONS

1. Production

Oil production during the month of December totalled 197,988 STB with a field GOR of 2.534 and an average production GOR of 70 GOR/STB. The average daily production rate for the month was 6,386 BOPD as compared to 6,245 BOPD in November. During the month 159 wells were in production and 15 wells were in injection. Cumulative oil production since inception to December 31 was 11,918,241 barrels. The cumulative oil production to December 31 was 11,918,241 barrels.

2. Injection

Total water injected during the month was 146,722 barrels at an average daily injection rate of 146.7 BOPD as compared to 16,435 BOPD for the month of November. Cumulative water injected to December 31 was 14,860,113 barrels.

(a) Plant No. 1

Total produced Mississippi water injected at Plant No. 1 during the month was 279,191 barrels for an average daily injection rate of 9,003 BOPD. Cumulative Mississippi water injected to December 31 was 27,175,113 barrels.

(b) Plant No. 2

Devonian water injected at Plant No. 2 during the month totalled 167,531 barrels for an average daily injection rate of 5,407 BOPD. Cumulative Devonian water injected to December 31 was 23,729,225 barrels.

3. Reservoir Voidage

The status of Reservoir voidage for December is presented on Table 1. Reservoir withdrawals exceeded water injection by 67,059 barrels for an average net voidage rate of - 2153 reservoir barrels per day.

1. 11-11-76	removed 1/10	11-11-76	removed
2. 11-11-76	1/10	11-11-76	removed
3. 11-11-76	1/10	11-11-76	removed

[illegible]

12-17-12 26
3-20-11 20
5-11-11 26

9-10-11-26
15-11-11-26
13-1-11-26

7 10 11 20
13 28 11-28
3 46 17 36

21. 04. 11. 20

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TABLE 7

ALLOCATION OF VOIDAGE RATES

Oil Produced (STB)	347,980
Water Produced (Bbls.)	307,910
Gas Produced (MSCF)	1,100
Avg. Solution GOR (SCF/STB)	40
Formation Volume Factor	1.25
Voidage Oil (Res. Bbls.)	200,860
Voidage Water (Res. Bbls.)	307,910
Total Voidage (Res. Bbls.)	508,770
Water Injected (Bbls.)	275,700
Net Voidage (Res. Bbls.)	233,070
NET VOIDAGE RATE (Res. Bbls./Day)	0.0006

DATE: 84-11-26

TO: ALL WORKING INTEREST OWNERS
NORTH VIRDEN SCALLION UNIT #1

Progress Report for 84-10

1. Production

Month	Oil Production		Water Prod. m ³	W.O.R.	Wells Prod.	Cumulative Oil m ³
	m ³	m ³ /d				
84-09	13 698.3	456.6	53 484.0	3.9	175	6 468 961.6
84-10	13 990.0	451.3	64 576.7	4.6	174	6 482 951.6

2. Water Injection

Plant	Volume Injected		Cumulative Injection m ³
	m ³	m ³ /d	
#1 9-16	31 025.5	1 000.8	8 217 985.4
#2 6-27	35 601.5	1 148.4	8 935 146.1
Total	66 627.0	2 149.2	17 153 131.5

3. Remedial

6-3-12-26 Reworked & reactivated
15-13-11-26 Tied in to header at 11-13
9-14-11-26 Changed flow tee

John Carter
for C. G. Folden , P. Eng.
Area Supervisor

4. Reservoir Voidage

The status of reservoir voidage for 84-10 is presented in the table below. Water injection exceeded reservoir withdrawals by 1 603.2 m³ for an average net voidage rate of -51.7 reservoir m³/day.

Reservoir voidage calculations exclude West Flank production, in accordance to permission received from the Oil and Natural Gas Conservation Board, November 27th, 1975. West Flank production includes wells 5-15, 7-16, 8-16, 9-16, 10-16, and 15-16 of Scallion Unit #1.

Calculation of Voidage Rates

Total Water Produced	64 576.7
Less West Flank Water	<u>13 448.9</u>
Net Water Produced(m ³)	51 127.8
Total Oil Produced	13 990.0
Less West Flank Oil	<u>755.7</u>
Net Oil Produced(Stm ³)	13 234.3
Net Oil Produced x 1.05 (Formation Volume Factor, 12.4m ³ /m ³ solution GOR)	
Voidage Oil (Res. m ³)	<u>13 896.0</u>
Voidage Oil	13 896.0
Plus Voidage Water(i.e. Net Water Produced)	<u>51 127.8</u>
Total Voidage (Res. m ³)	65 023.8
Total Voidage	65 023.8
Less Water Injection(7-16 WIW Ex)	<u>66 627.0</u>
Net Voidage (Res. m ³)	-1 603.2
Net Voidage Rate (Res. m ³ /day)	<u>-51.7</u>

Map Oversized

North Virden – Scallion Area

Phase II Devonian Flood Fronts

Isosaturation Contours

May 31, 1972

F-9608-7

Please contact
Engineering Department

MB Industry Trade and Mines