May 2, 1966

The Oil and Natural Gas Conservation Board,
Department of Mines and Natural Resources,
Room 310, Legislative Building,
Winnipeg 1, Manitoba.

Attention: Mr. Stuart B. Anderson, Chairman.

Dear Sir:

Bralorne Petroleums Ltd. hereby makes application to conduct a pilot water flood in Section 35 and Section 36, Township 9, and Range 29, WPM, during the summer months of 1966.

The enclosed application is presented in report form and includes drilling and production history, geology, estimated primary recovery, estimated waterflood recovery, and the proposed pilot waterflood. Numerous exhibits will be found following the discussion. The consent of all working interest and royalty interest owners was requested. Those replies which have been received are included in the application.

Permission has been requested of the Department of Agriculture and Conservation, Water Control and Conservation Branch, to use water from Pipestone Creek for the pilot flood. Their approval has not been received to date. This application is submitted in anticipation of such approval and to enable an early summer start of operations.

Mention will be made in several cases of Paradise Petroleums Ltd. Please be advised that the name has been changed to Bralorne Petroleums Ltd.

Yours very truly,

BRALORNE PETROLEUMS LTD.

Per:

HBE/dmb

H. B. Elder, Petroleum Engineer.

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA

P.O. BOX ~~1327~~ #1240
VIRDEN, MANITOBA

March 8, 1966.

Canada Permanent Trust Company
433 Portage Avenue
Winnipeg 2, Manitoba.

Gentlemen:

As a royalty interest owner under the SE¼ of Section 35-9-29 WPM, Ebor area, Manitoba, you are undoubtedly aware that producing wells have suffered a rapid production decline. The wells are at, or near, the economic limit of production.

Paradise Petroleums Ltd. is preparing an application to the Minister, Department of Mines and Natural Resources, for permission to conduct a pilot water flood in Section 35 and 36-9-29 with Paradise N.Ebor 9-35-9-29 as the injection well. The purpose of the pilot flood is to determine if sufficient additional oil can be recovered to justify the formation of a waterflood unit.

The written consent of royalty interest owners should be included with the application. If you have no objections, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per: H. B. Elder

H. B. Elder, P. Engineer.

HBE/dmb

APPROVED THIS 6th DAY OF June, 1966.

CANADA PERMANENT TRUST COMPANY

Per: [illegible]
Assistant MANAGER AT WINNIPEG BRANCH

[illegible]
ASSISTANT MANAGER AT WINNIPEG BRANCH

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA

P.O. BOX XXXX #1240
VIRDEN, MANITOBA

RECEIVED
MAR 14 1966
Canada Permanent Trust Co.
Winnipeg, Man.

March 11, 1966

Canada Permanent Trust Company
433 Portage Avenue
Winnipeg, Manitoba.

Dear Sirs:

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The written consent of royalty interest owners should be included with the application. If you have no objections, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per: H. B. Elder

H. B. Elder, P. Engineer.

HBE/dmb

APPROVED THIS 6th DAY OF ~~MARCH~~ June, 1966.

~~THE~~ CANADA PERMANENT TRUST COMPANY

Per: [illegible]
MANAGER AT WINNIPEG BRANCH

[illegible]
ASSISTANT MANAGER AT WINNIPEG BRANCH

Application to:

The Oil and Natural Gas Conservation Board,
Department of Mines and Natural Resources
Province of Manitoba

For:

Pilot Water Flood
Sec. 35 and Sec. 36, Twp. 9, Rge 29, WPM
Ebor and North Ebor Area
Province of Manitoba

By:

BRALORNE PETROLEUMS LTD.
Virden, Manitoba

April, 1966

H. B. Elder, Petroleum Engineer

PROVINCE OF MANITOBA
H. B. ELDER
REGISTERED ENGINEER

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## EXHIBITS


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INTRODUCTION:

The Ebor Field and North Ebor area are located two miles west of the southwest flank of the Daly field. (Fig. XII) The area under consideration in this study lies in Sections 35 and 36, Twp. 9, Rge. 29, WPM. At this time there are eight producing wells, five operated by Paradise Petroleums Ltd. and three by Texas Crude Oil Co.

Production rate decline has been very rapid, typical of a highly undersaturated solution gas drive reservoir, and a very low recovery of oil in place is indicated. The rapid decline discouraged development drilling and pool limits have not been defined.

Water rates appear to have peaked, and now have assumed a downward trend which indicates that an effective water drive is not present.

While waterflood recoveries are based largely on assumptions, it is believed that chances for a successful flood are favorable. A successful pilot flood would extend the producing life of the area and would be a definite incentive to further development drilling. There is sufficient acreage held by Bralorne (Fig. XII) and Texas Crude Oil Company to justify a full scale flood if test results are favorable. An unsuccessful pilot flood, or no pilot flood, will result in abandonment of the area in the near future.

HISTORY:

The area under study was drilled as follows:

| Company | Well No. | Date |
|---|---|---|
| Texas Crude | 2-36 | November, 1963 |
| Paradise | 9-35 | November, 1964 |
| Paradise | 11-36 | January, 1965 |
| Paradise | 13-36 | February, 1965 |
| Paradise | 7-35 | February, 1965 |
| Paradise | 1-35 | February, 1965 |
| Texas Crude | 6-36 | February, 1965 |
| Texas Crude | 5-36 | February, 1965 |

Initial production tests for individual wells varied from 30-50 BOPD with negligible water cuts. The production decline was very rapid. (Tables I, II, and decline curves) Present water cuts vary from 20-80%. Peak area production was 6657 BO in May, 1965. Production for November, 1965, was 4039 BO; for December, 3700 BO.

As a result of the rapid production decline, the eight wells were shut in June, 1965, and bottom hole pressure bombs run in two wells for bottom hole pressure build up tests. (Fig. XVI) 9-35 5-36 When bottom hole pressures had stabilized, as determined from bomb readings, bombs were left in the two test wells and the remaining six wells placed on production for interference tests. Build up pressures were as follows:

| Well | Fluid in Hole | Csg. Pressure | BHP | BHP by | June 1965 |
|---|---|---|---|---|---|
| 1-35 | 135 feet | 226# | 276# | Calculation | 2113 |
| 7-35 | csg full | 101# | 1061# | Bomb extrapolated | 2923 |
| 9-35 | 911 feet | 55# | 402# | Calculation | 6002 |
| 11-36 | 504 feet | 35# | 222# | Calculation | 2626 |
| 13-36 | csg full | 135# | 1090# | Calculation | 2965 |
| 2-36 | 262 feet | 12# | 109# | Calculation | 1860 |
| 5-36 | 820 feet | 101# | 416# | Bomb extrapolated | 2890 |
| 6-36 | 1757 feet | 26# | 676# | Calculation | 1372 |

The calculated BHP were determined using feet of fluid in the hole and casing pressures. On interference tests, no interference was indicated. An extrapolation of pressures obtained on DST of 9-35 gave 1080# as original bottom hole pressure.

The chloride content of produced water varies from well to well.

| Well | Chlorides | December, 1965 water cut, % |
|---|---|---|
| 1-35 | 70,500 | 33 |
| 7-35 | 29,700 | 82 |
| 9-35 | 28,100 | 40 |
| 13-36 | 28,500 | 64 |
| 2-36 | 91,900 | 66 |
| 5-36 | 97,966 | 18 |
| 6-36 | | 30 |
| 11-36 | | 20 |

The pay interval in all wells has been diamond cored and analyzed. (Fig. XV)

There appears to be no logical engineering explanation for the variations in productive capacity, chloride content and water cuts.

COMPLETION PRACTICES:

In all wells casing has been set through and the pay interval perforated. Normally, any section having the slightest possibility of production is opened up. Well 2-36 was fraced with 15,000# sand. The remaining wells were fraced with 25-30,000# sand in two stages. Individual well details are given in Table III.

GEOLOGY:

The producing interval in this area occurs in the Lodgepole formation of the Mississippian period. It is found above the Crinoidal zone which produces to the east. A typical pay interval could be described as dolomite, brown to cream, dense tight, microcrystalline-microgranular, siliceous interbeds and maroon shale laminae scattered throughout, poor intergranular to pin point vuggy porosity, anhydrite interbeds, 45% oil stained with spotty slow bleeding, pay occurs as scattered interbeds.

Top of porosity is found from two feet to 32 feet below the top of the lodgepole. There appears to be no correlation of porosity zones between wells. A structure contour map on top of the Mississippian is included as a part of this report. (Fig. XII) Contours indicate a nosing to the south. No closed structure is evident. Available core analysis summaries are included with this report. (Fig. XV) Copies of induction electrolog and acoustilog are shown in Figures XX and XXI.

PRIMARY RECOVERY:

The calculated oil in place, using averaged core analysis data, is 1,336,000 bbls. per 160 acres. An extrapolation of the production decline curve for the eight wells indicates a primary recovery of 90,000 bbls. Plotting daily oil rate against accumulative recovery for the eight wells indicates a primary recovery of 98,000 bbls. It appears that primary means will recover approximately 2% of oil in place. Accumulative production for the eight wells to January 1, 1966, is 62,132 bbls. It is obvious that primary recovery is approaching the economic limit. Sonic measurements and the bottom hole pressure survey indicate that most wells are in an advanced stage of pressure depletion.

WATERFLOOD RECOVERY

It is difficult to make a proper analysis of the feasibility of waterflooding this area. The limits of the reservoir have not been defined and net pay is difficult to evaluate due to inability to correlate pay sections. Reservoir fluid properties have not been determined. It was anticipated that a reservoir fluid sample would be obtained for complete analysis following the bottom hole pressure tests of June, 1965. However, an examination of test results made it evident that a reservoir sample analysis from one well would not have field wide application. The analysis was not run.

The data used in the following statements were derived from core analyses, electric log interpretation and a study of waterflood operations in the Virden area.

1. Residual oil at start of flooding is estimated to be 98.8% of the original oil in place based on an estimated primary recovery of 2% and a shrinkage factor of 0.95.

2. Residual oil following flooding is estimated to be 25% of pore volume based on core analyses.

3. The waterflood unit displacement efficiency is calculated to be:

$$\frac{1 - Sw - Sor}{1 - Sw} = \frac{1 - .45 - .25}{1 - .45} \times 100 = 46\%$$

Where:

Sw = Connate Water Saturation - (electric logs)

Sor = Residual oil Saturation - (core analyses)

4. The vertical sweep efficiency is estimated at 70% based on poor permeability stratification.

5. The areal sweep efficiency is estimated at 65%, being less than the maximum sweep efficiency of a 5 spot pattern.

6. The overall waterflood efficiency is calculated to be:

Unit displacement x vertical sweep x areal sweep

$$.46 \times .70 \times .65 \times 100 = 21\%$$

Since the area which could possibly be waterflooded by injecting at 9-35-9-29 is approximately 160 acres ( Fig. XI) the following calculations refer only to a 160 acre tract:

Original Oil in place (OOIP):

= 7758 x porosity x (1 - Sw)

= 7758 x .12 x .55

= 477 bbls/acre - foot

OOIP 17½ feet of pay and 160 acre tract:

= 1,336,000 bbls.

OOIP Recoverable:

= OOIP - (OOIP x Sor)

= 1,336,000 - (1,336,000 x .25)

= 1,002,000 bbls.

OOIP Recoverable Minus Primary Recovery (2%)

= 1,002,000 - 98,000

= 904,000 bbls

Oil Recoverable by flooding

= 904,000 x .19

= 171,000 bbls per 160 acre tract.

PROPOSED PILOT WATERFLOOD

It is proposed that Paradise N. Ebor 9-35-9-29 be used as an injection well during the test period and water for injection be obtained from Pipestone Creek.

N. Ebor 9-35 was selected as the injection well because of its central location. There would be one observation well on 40 acre spacing and four wells on 80 acre spacing; the injection well being surrounded on three sides (Fig. XI) The injection interval would be 2569 - 2576 and 2583 - 2595. (Fig. XIV) Swelling tests run on core samples indicate that no swelling problems would be expected with either fresh or salt water. (Fig. XIX) The initially desired injection rate is 500 - 1000 bbls per day in order to re-occupy the voidage occasioned by produced reservoir fluids. It is possible that surface pressures may exceed the overburden pressure at this time due to the high pressure loss immediately around the bore hole. Surface pressures exceeding the overburden pressure can be possibly expected at later stages due to the banded permeability characteristics of the reservoir. Experience in this area has indicated that when injection pressure is limited to overburden pressure, the resulting injection rates are often so low that no beneficial results are obtained. Some successful results have been realized in tight formations in the United States with high pressure - high volume waterfloods in which injection pressures exceed the overburden pressure. It is felt that

article Petrol Engineer Sept. 1965

exceeding the overburden pressure will result in no reservoir damage as all wells had to be fraced to be capable of production.

Permission has been requested of the Department of Agriculture and Conservation, Water Control and Conservation branch to use water from Pipestone Creek for the pilot flood. Calculations indicate this to be a more economical approach than hauling salt water from the Daly Field. In addition, the chances of maintaining a continuous operation are improved. In the event of a successful pilot flood, a more suitable water source would be required. For the test period, a surface pipe line would handle water from a pump located on the creek to the disposal pump at N. Ebor 9-35. (Fig. XIII)

Providing fresh water is used for injection, no anti-corrosion measures are planned. However, a filter will probably be required.

The proposed test period for the pilot flood is 180 days.

TABLE 1

1964 PRODUCTION

TEXAS CRUDE EBOR 2-36-9-29

| | Oil - bbls. | Water - bbls. |
|---|---|---|
| February | 359 | 371 |
| March | 786 | 713 |
| April | 403 | 400 |
| May | 74 | 90 |
| June | 535 | 560 |
| July | -- | -- |
| August | 590 | 605 |
| September | 805 | 737 |
| October | 729 | 686 |
| November | 869 | 782 |
| December | 828 | 734 |
| | 5978 | 5678 |

## TABLE II MONTHLY PRODUCTION 1965. (Bbls)

| | | 2-36 | 9-35 | 11-36 | 13-36 | 7-35 | 1-35 | 6-36 | 5-36 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| December, 1964 | Oil | 828 | 431 | | | | | | | 1255 |
| | Water | 734 | | | | | | | | 734 |
| January, 1965 | Oil | 771 | 1475 | | | | | | | 2246 |
| | Water | 683 | | | | | | | | 683 |
| February, 1965 | Oil | 681 | 959 | | | | | | | 1640 |
| | Water | 619 | | | | | | | | 619 |
| March, 1965 | Oil | 653 | 977 | 902 | 335 | 440 | | | 467 | 3774 |
| | Water | 850 | 283 | 30 | 50 | 90 | | | 84 | 1387 |
| April, 1965 | Oil | 602 | 863 | 917 | 1020 | 1059 | 974 | 61 | 609 | 6105 |
| | Water | 643 | 530 | 54 | 171 | 90 | 187 | 262 | 36 | 1973 |
| May, 1965 | Oil | 591 | 645 | 601 | 1036 | 859 | 792 | 565 | 1568 | 6657 |
| | Water | 775 | 270 | 122 | 353 | 385 | 160 | 485 | 126 | 2676 |
| June, 1965 | Oil | 531 | 575 | 368 | 805 | 792 | 468 | 592 | 264 | 4395 |
| | Water | 762 | 570 | 130 | 555 | 620 | 189 | 232 | 44 | 3402 |
| July, 1965 | Oil | 476 | 774 | 417 | 1025 | 925 | 1114 | 885 | 972 | 6588 |
| | Water | 708 | 300 | 79 | 290 | 405 | 216 | 454 | 135 | 2587 |
| August, 1965 | Oil | 483 | 450 | 460 | 847 | 885 | 738 | 810 | 1116 | 5789 |
| | Water | 663 | 300 | 280 | 1002 | 435 | 348 | 427 | 155 | 3610 |
| September, 1965 | Oil | 491 | 510 | 480 | 810 | 725 | 690 | 872 | 804 | 5382 |
| | Water | 763 | 360 | 312 | 2430 | 432 | 390 | 237 | 116 | 5040 |
| October, 1965 | Oil | 463 | 310 | 279 | 903 | 775 | 744 | 690 | 879 | 5043 |
| | Water | 465 | 124 | 110 | 1876 | 1840 | 350 | 233 | 131 | 5129 |
| November, 1965 | Oil | 421 | 270 | 270 | 360 | 726 | 605 | 739 | 648 | 4039 |
| | Water | 604 | 120 | 120 | 960 | 1755 | 270 | 266 | 150 | 4245 |
| December, 1965 | Oil | 340 | 186 | 363 | 643 | 434 | 540 | 647 | 547 | 3700 |
| | Water | 654 | 124 | 93 | 1127 | 1955 | 270 | 280 | 120 | 4623 |

## TABLE III WELL COMPLETION DETAILS

| Well | KB | T.D. | Miss. Top | Porosity Top | Casing Size | Casing Depth | Perforations | Treatment |
|---|---|---|---|---|---|---|---|---|
| 2-36 | 1720 | [redacted] | -820 | -822 | 4 1/2 | 2636 | -824-842 | 250 gals mud acid<br>1000 gals reg. acid<br>Frac 15,000# sand. |
| 9-35 | 1730 | [redacted] | -814 | -839 | 4 1/2 | 2601 | -839-846<br>-853-865 | Frac 25,000# sand. |
| 1-35 | 1707 | [redacted] | -831 | -863 | 4 1/2 | 2600 | -835-838<br>-842-843<br>-852-856<br>-862-869<br>-876-890 | Frac 26,500# sand. |
| 7-35 | 1716 | [redacted] | -833 | -851 | 4 1/2 | 2600 | -849-882 | Frac 30,000# sand. |
| 11-36 | 1722 | [redacted] | -807 | -828 | 4 1/2 | 2595 | -829-839<br>-844-852 | Frac 25,000# sand. |
| 13-36 | 1724 | [redacted] | -808 | -830 | 4 1/2 | 2588 | -832-856 | Frac 25,000# sand. |
| 5-36 | 1725 | [redacted] | -825 | -840 | 4 1/2 | 2642 | -841-861 | Frac 25,000# sand. |
| 6-36 | 1721 | [redacted] | -819 | -831 | 4 1/2 | 2608 | -831-843 | Frac 23,000# sand. |

## TABLE IV

Accumulative production to January 1, 1965:

| Well No. | Oil - Bbls. | Water - Bbls. |
|---|---|---|
| Ebor #1-35 | 6665 | 2380 |
| Ebor #7-35 | 7620 | 8007 |
| Ebor #2-36 | 12481 | 13867 |
| Ebor #5-36 | 7970 | 1097 |
| Ebor #6-36 | 5861 | 2876 |
| N. Ebor #9-36 | 8425 | 2981 |
| N. Ebor #11-36 | 5056 | 1330 |
| N. Ebor #13-36 | 7784 | 8814 |
| | 61,862 | 41,352 |

Corrected Copy.

TABLE IV

TABLE ~~XXI~~ IV

## ACCUMULATIVE PRODUCTION TO JANUARY 1, 1966

| Well No. | Oil - bbls | Water - bbls. | |
|---|---|---|---|
| Ebor 1-35 | 6665 | 2380 | 9,045 |
| Ebor 7-35 | 7620 | 8007 | 15,627 |
| Ebor 2-36 | 13867 | 12481 | 26,348 |
| Ebor 5-36 | 1097 | 7970 | 9,067 |
| Ebor 6-36 | 2876 | 5861 | 8,737 |
| N. Ebor 9-35 | 7994 | 2981 | 10,975 |
| N. Ebor 11-36 | 5056 | 1330 | 6,386 |
| N. Ebor 13-36 | 7784 | 8814 | 16,598 |
| | 52959 | 49824 | 102,783 bbls |

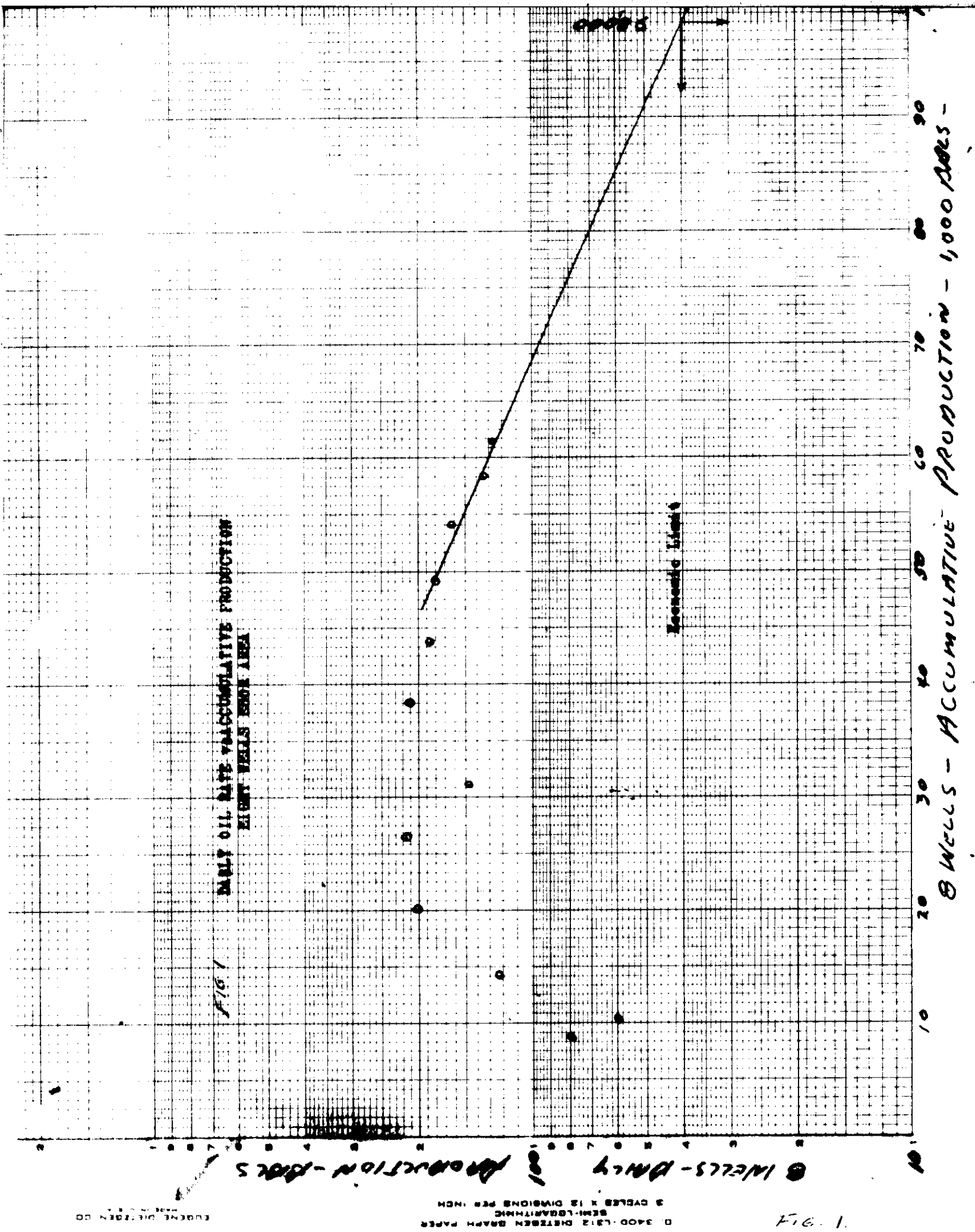

DAILY OIL RATE VS ACCUMULATIVE PRODUCTION
ELM AREA WELLS EAST AREA
FIG 1
Extended Limit
8 Wells - Daily Production - Barrels
8 Wells - Accumulative Production - 1,000 Barrels
0
10
20
30
40
50
60
70
80
90
100
EUGENE DIETZGEN CO.
D. 3400-L312 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 12 DIVISIONS PER INCH

FIG. 1.

PRODUCTION DECLINE CURVE

SEC. 35 & 36-9-29 WPM

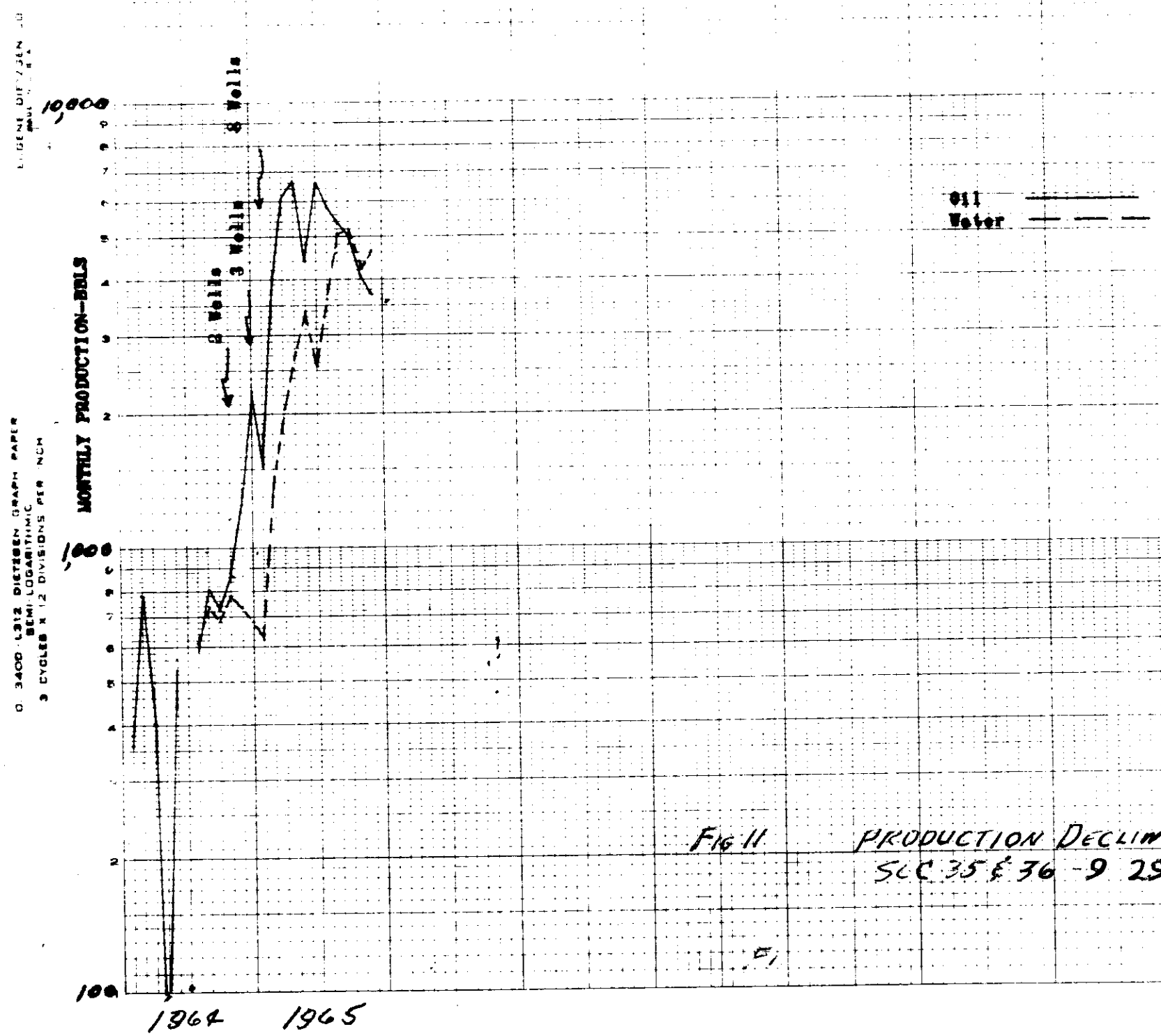
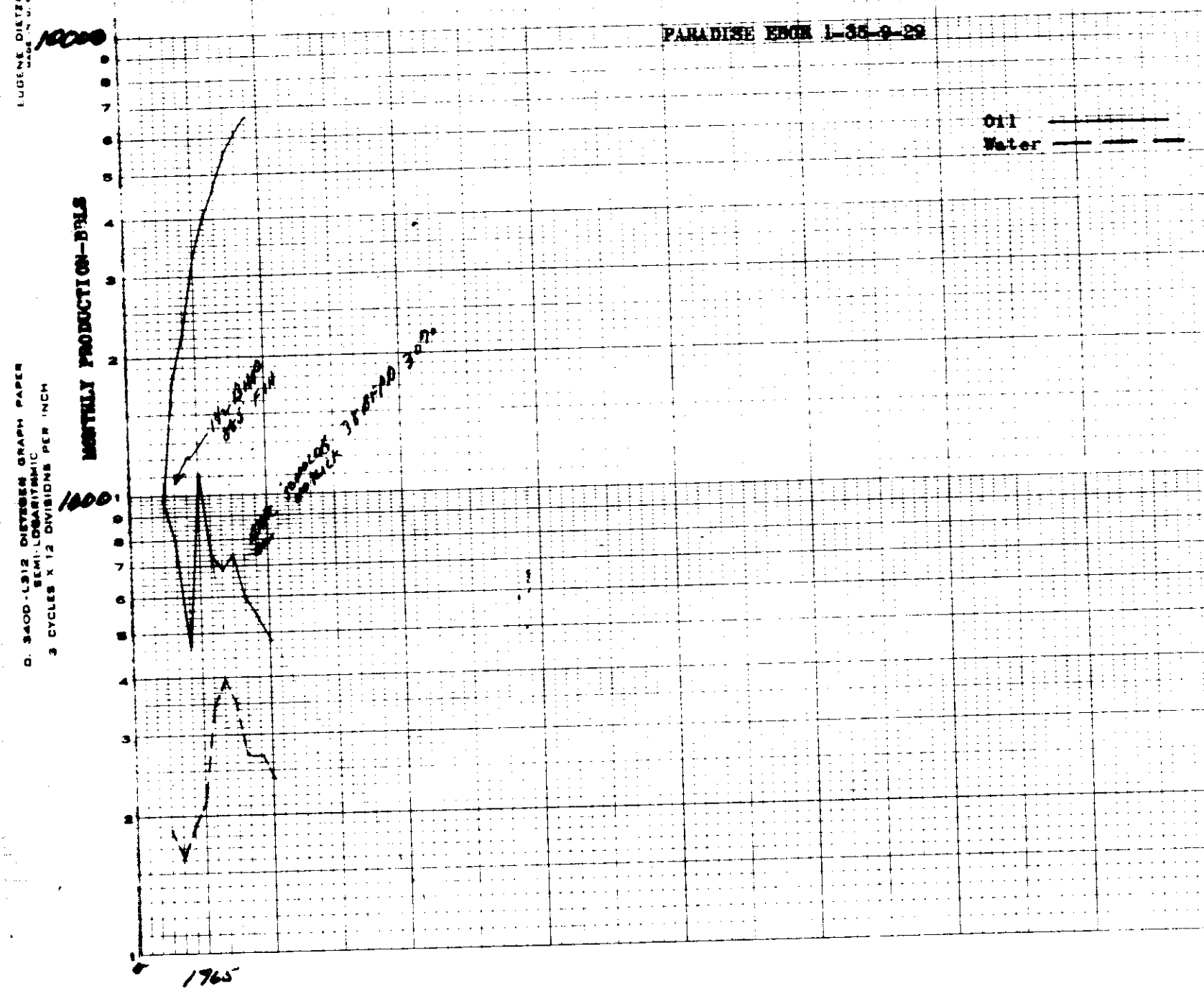



FIG 11 PRODUCTION DECLINE CURVE
SEC 35 & 36 - 9 29

FIG III PRODUCTION DECLINE CURVE

PARADISE EDGE 1-35-9-29



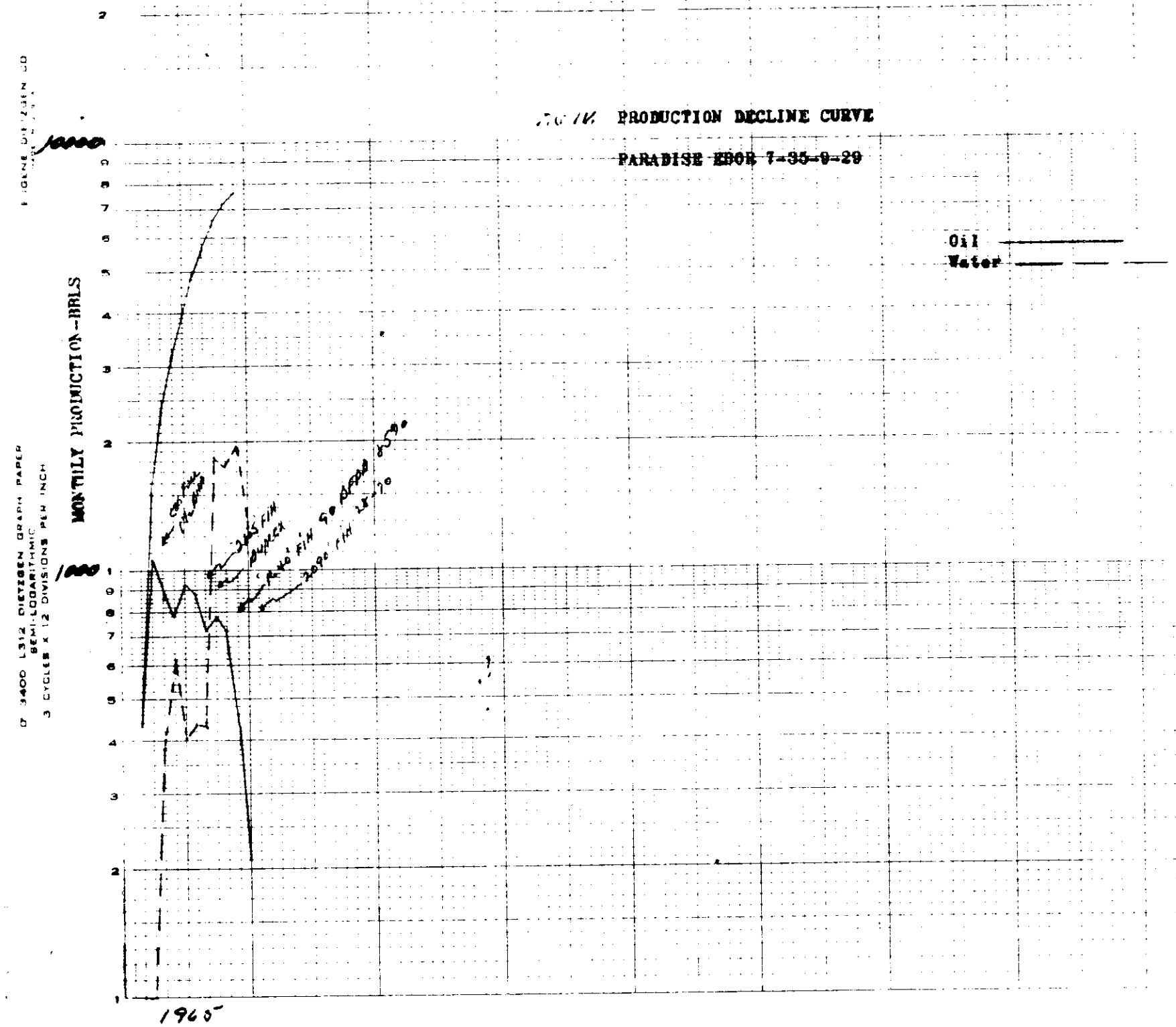

PRODUCTION DECLINE CURVE
PARADISE ~~EBOR~~ 7-35-9-29
Oil
Water
MONTHLY PRODUCTION--BBLS
1960

FIG V. PRODUCTION DECLINE CURVE

PARADISE N. EBOR ~~1-35-9-29~~

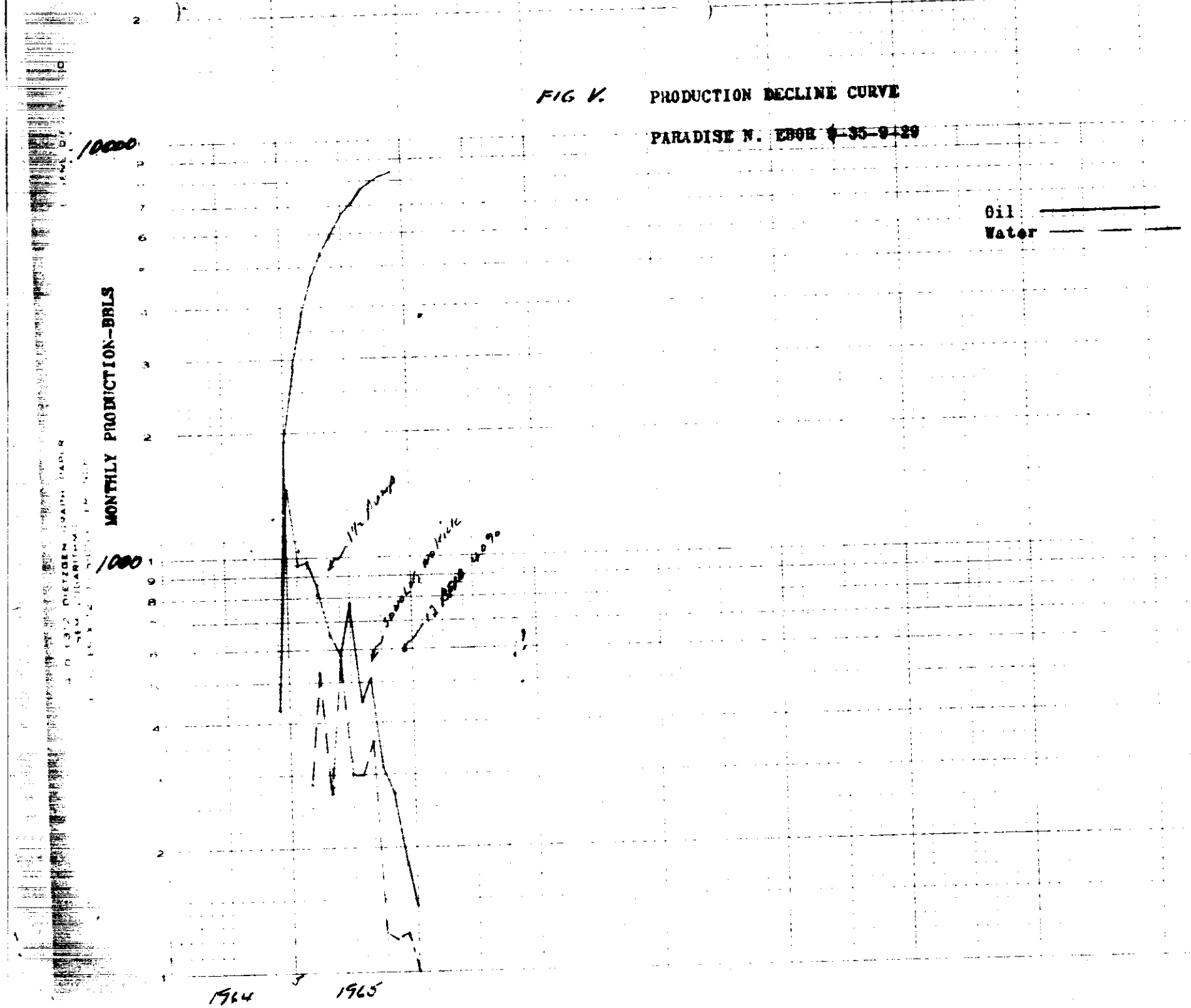


FIG VI. PRODUCTION DECLINE CURVE

PARADISE N. EBOR 11-36-9-29

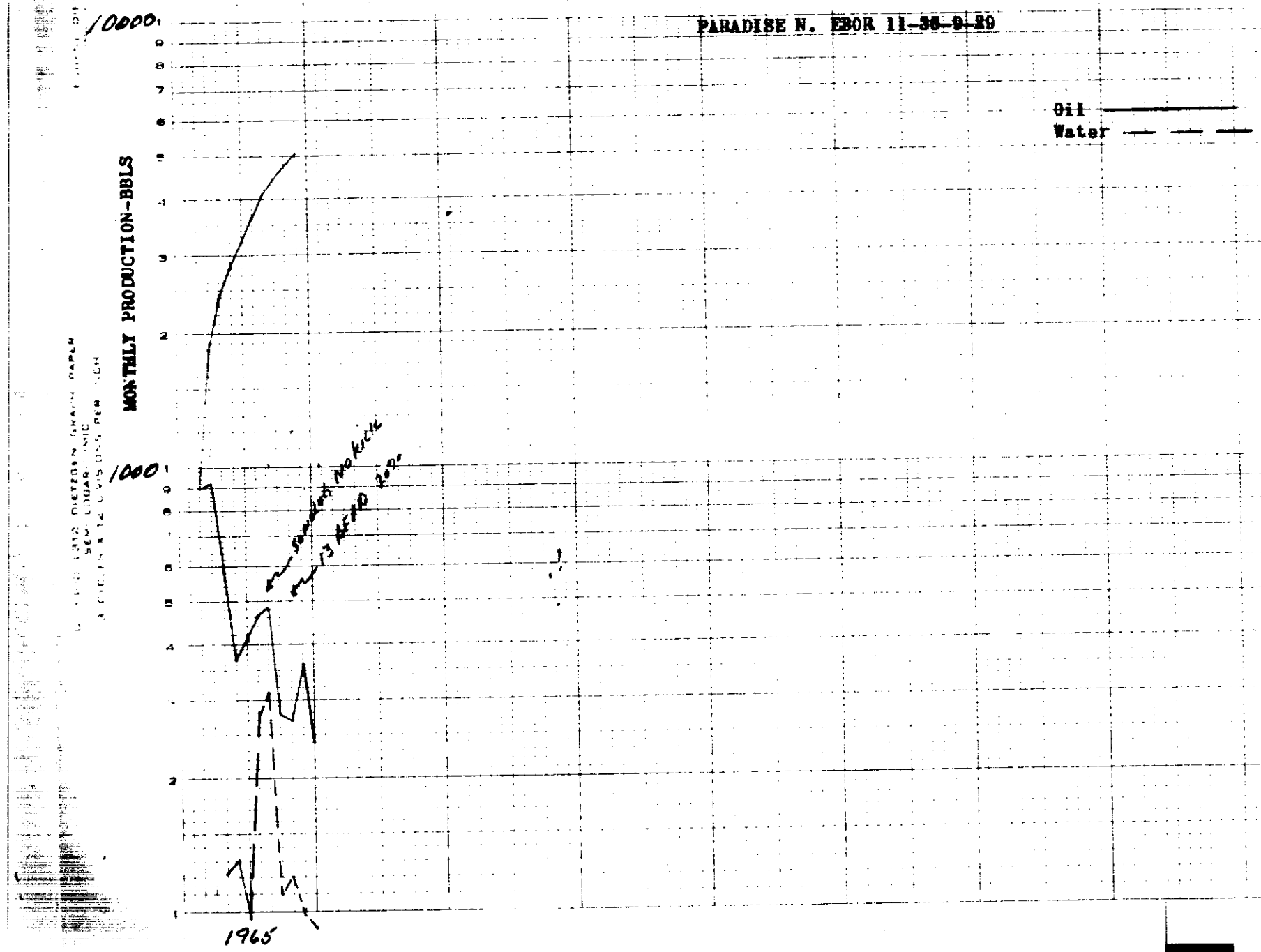
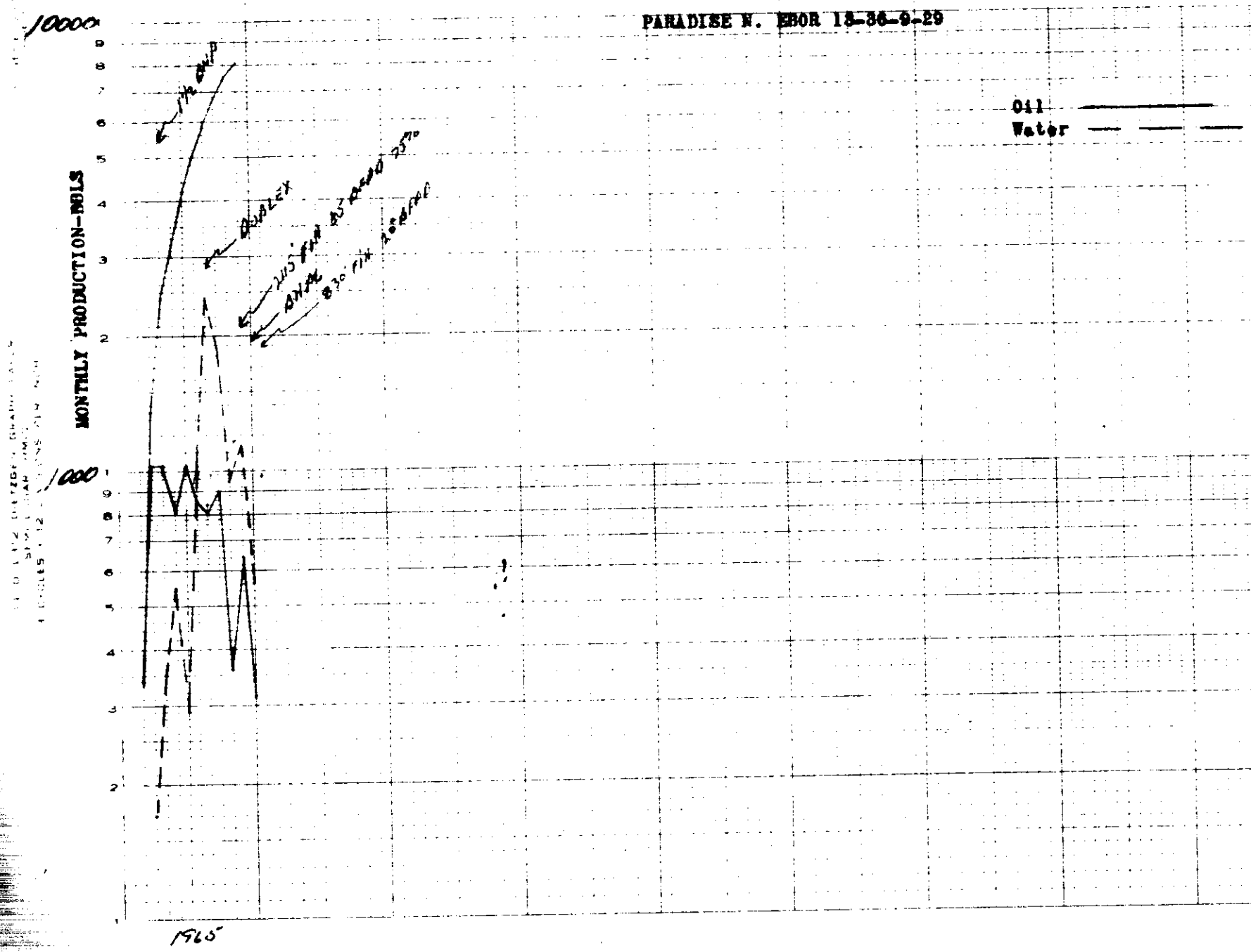


FIG VII. PRODUCTION DECLINE CURVE

PARADISE N. EBOR 13-36-9-29



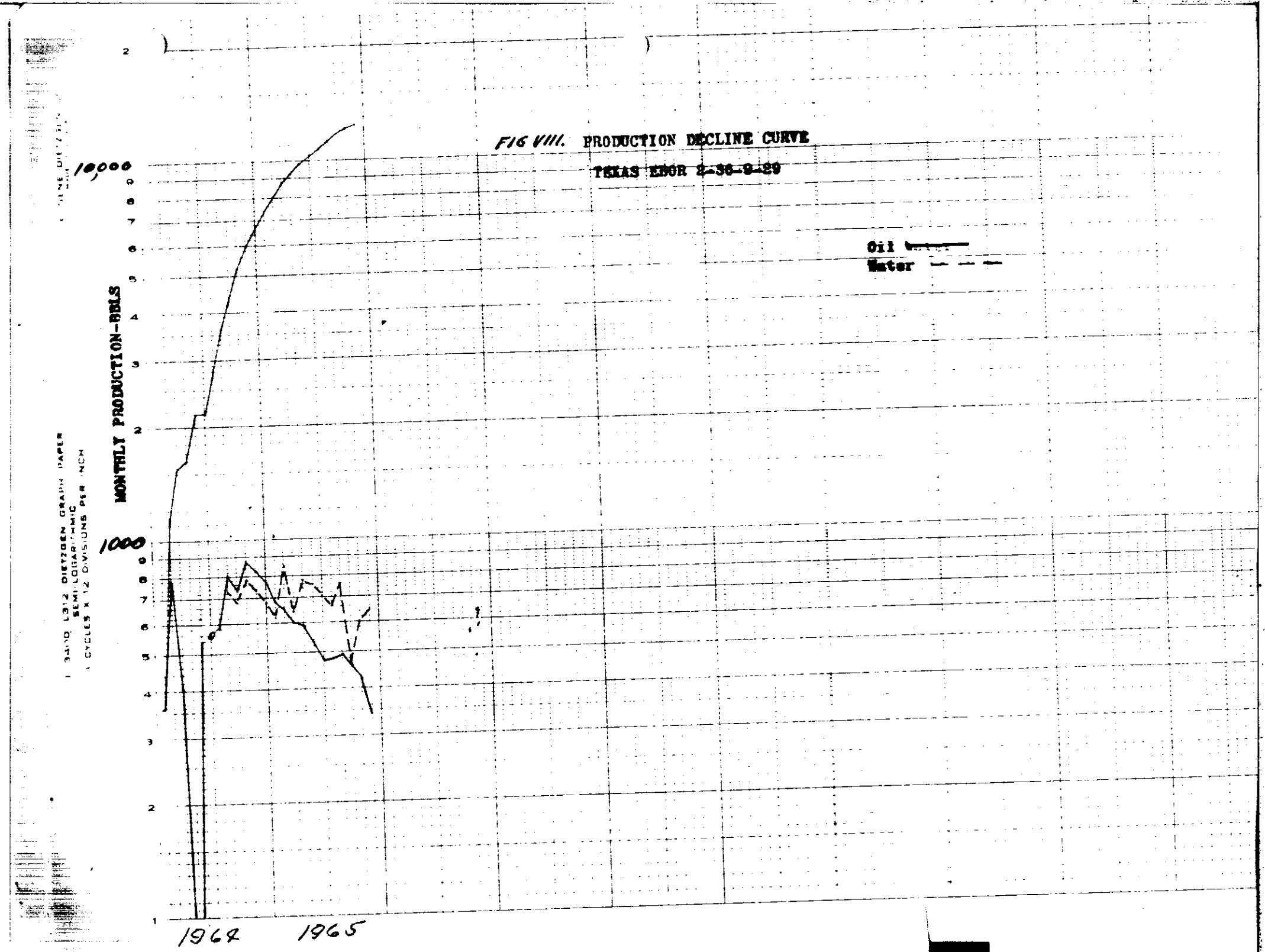


FIG VIII. PRODUCTION DECLINE CURVE
TEXAS EBOR 2-36-9-29
Oil
Water
MONTHLY PRODUCTION-BBLS
10,000
1000
1964
1965

FIG IX. PRODUCTION DECLINE CURVE

TEXAS EBOR 5-36-9-29

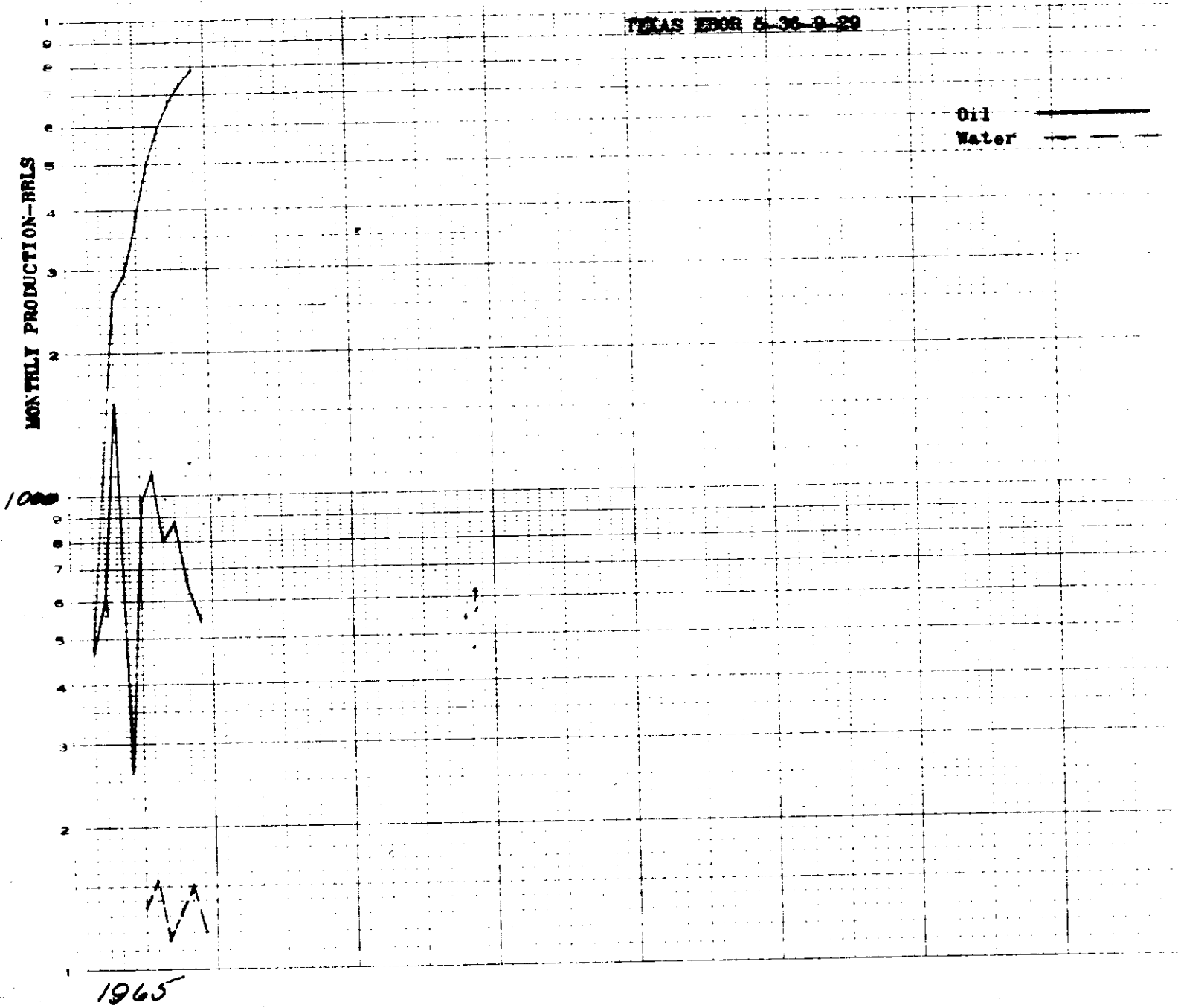
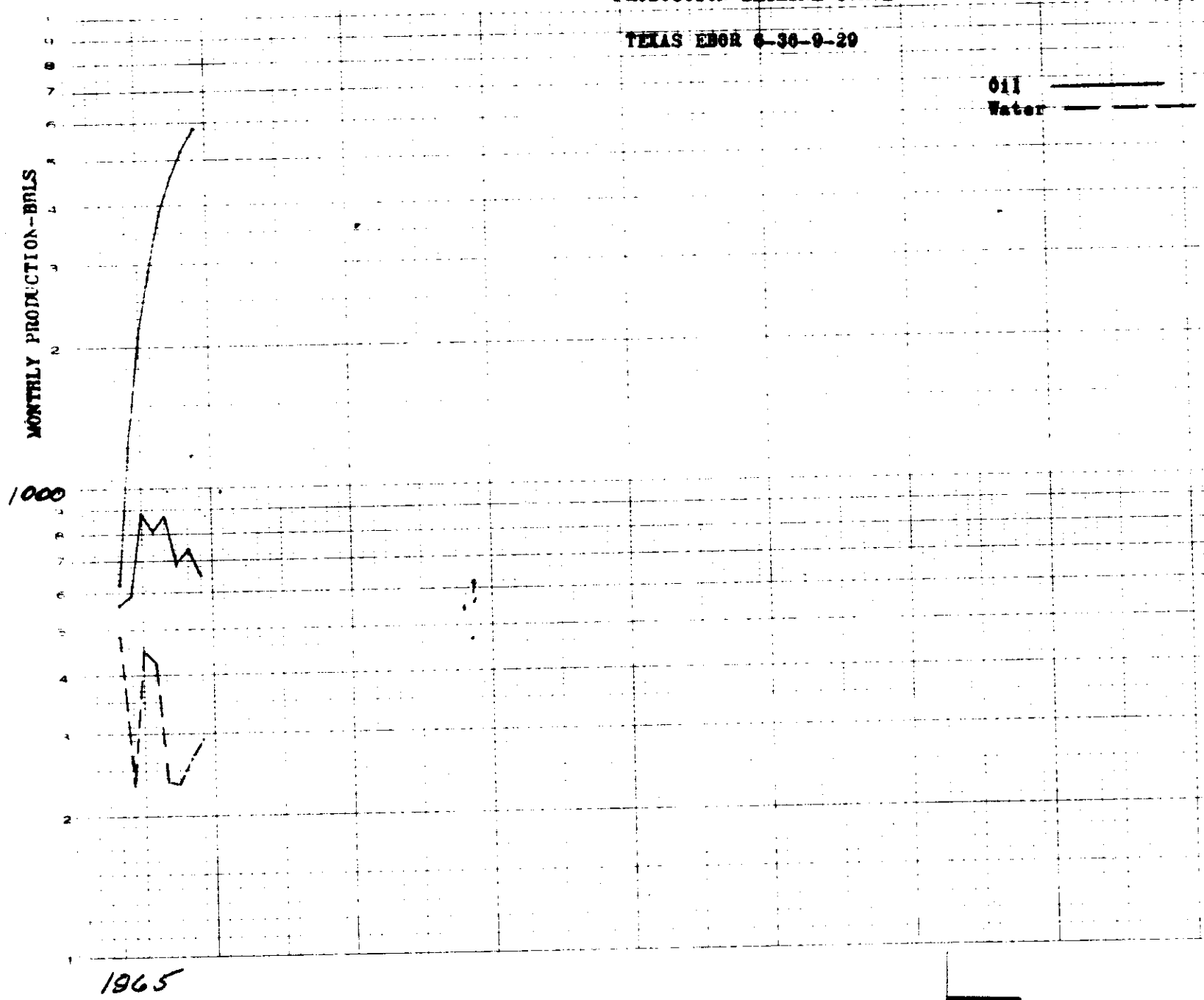


FIG X. PRODUCTION DECLINE CURVE

TEXAS EBOR 6-30-9-20



RANGE 29

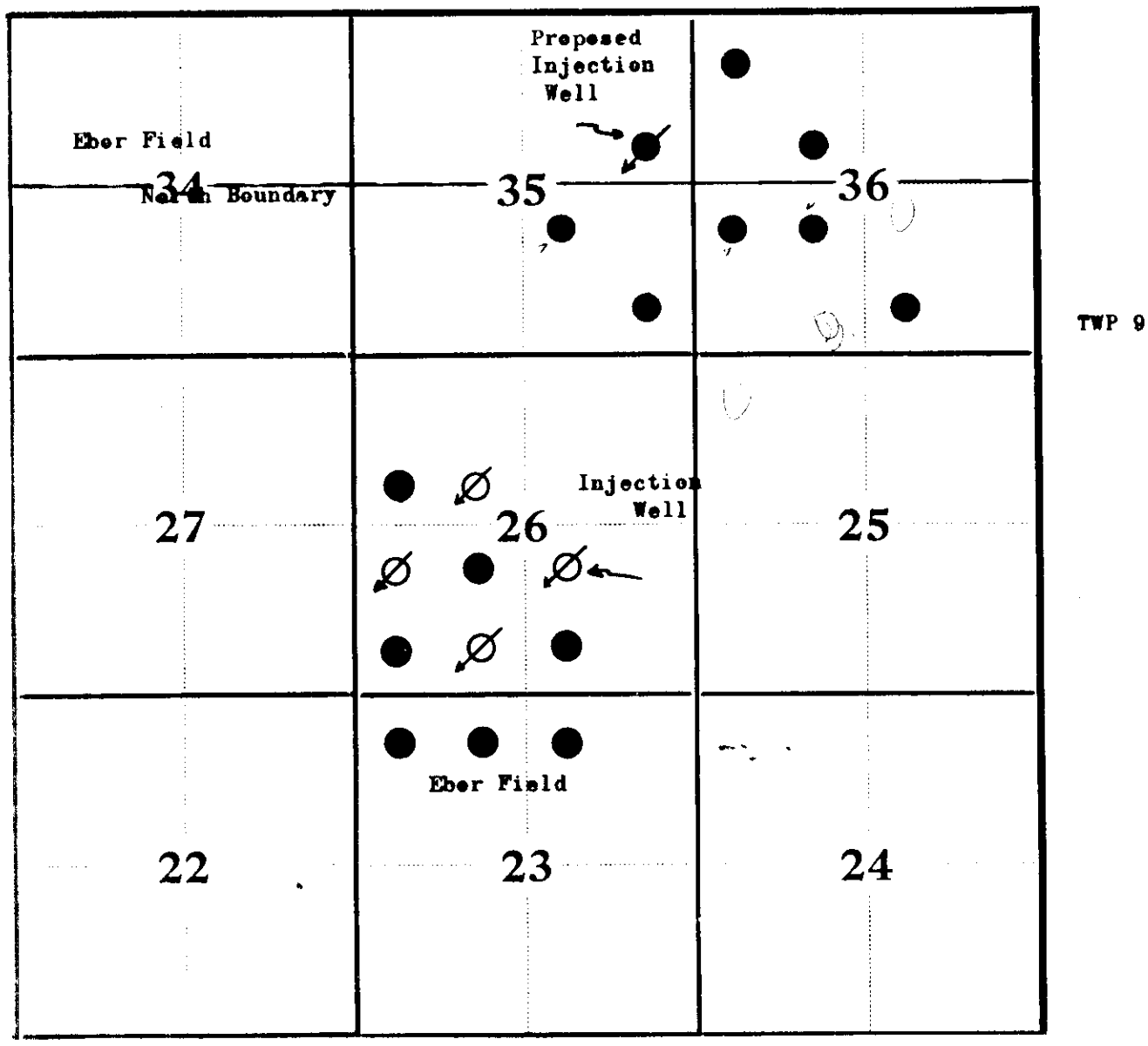



Figure XI Section 35 & 36-9-29 WPM well location map.

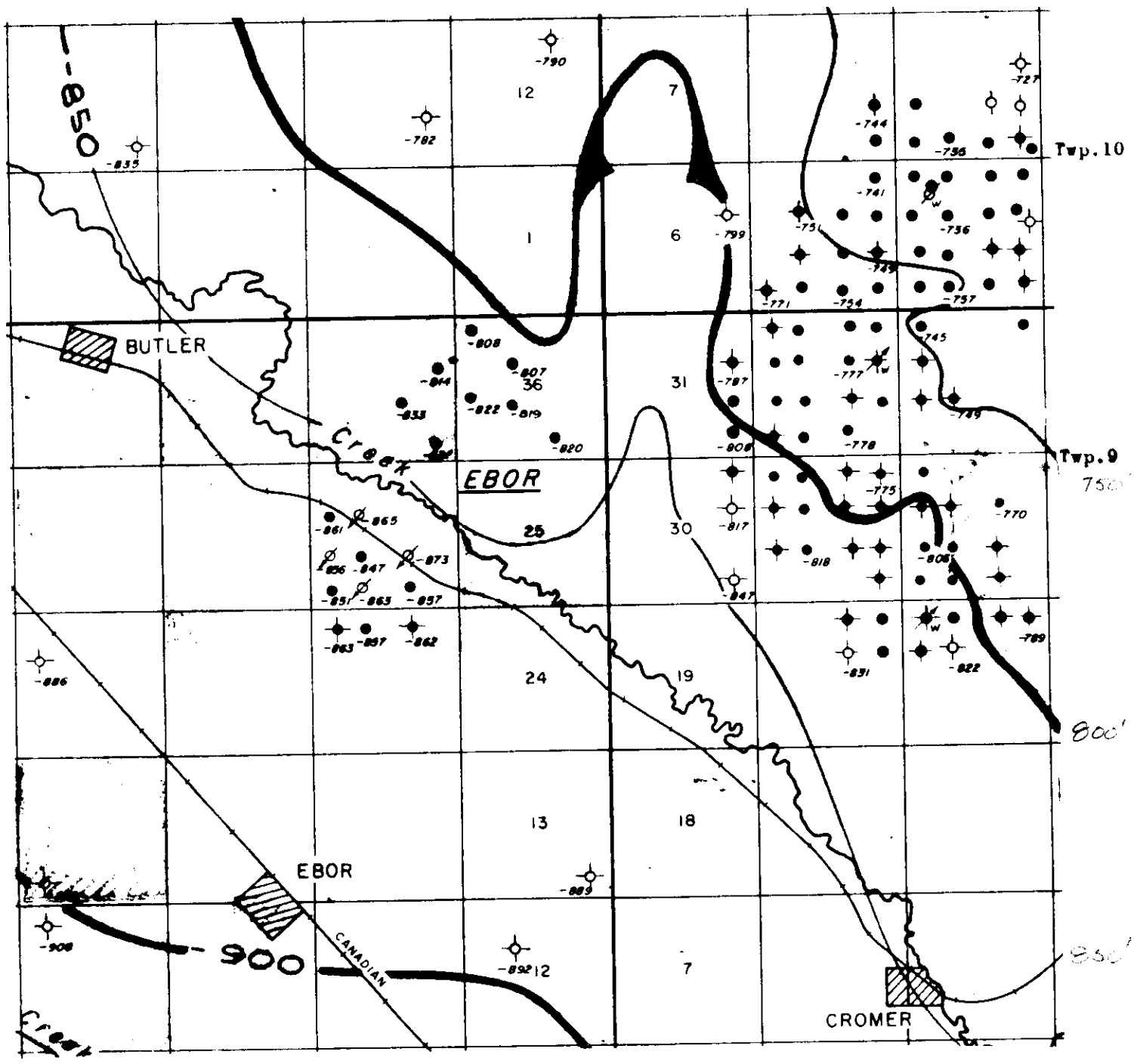



Figure XII* Ebor area structure contour map.
Contour interval 50 feet.

* Shaded areas indicate acreage held by Paradise Petroleums Ltd.

Top of Mississippian

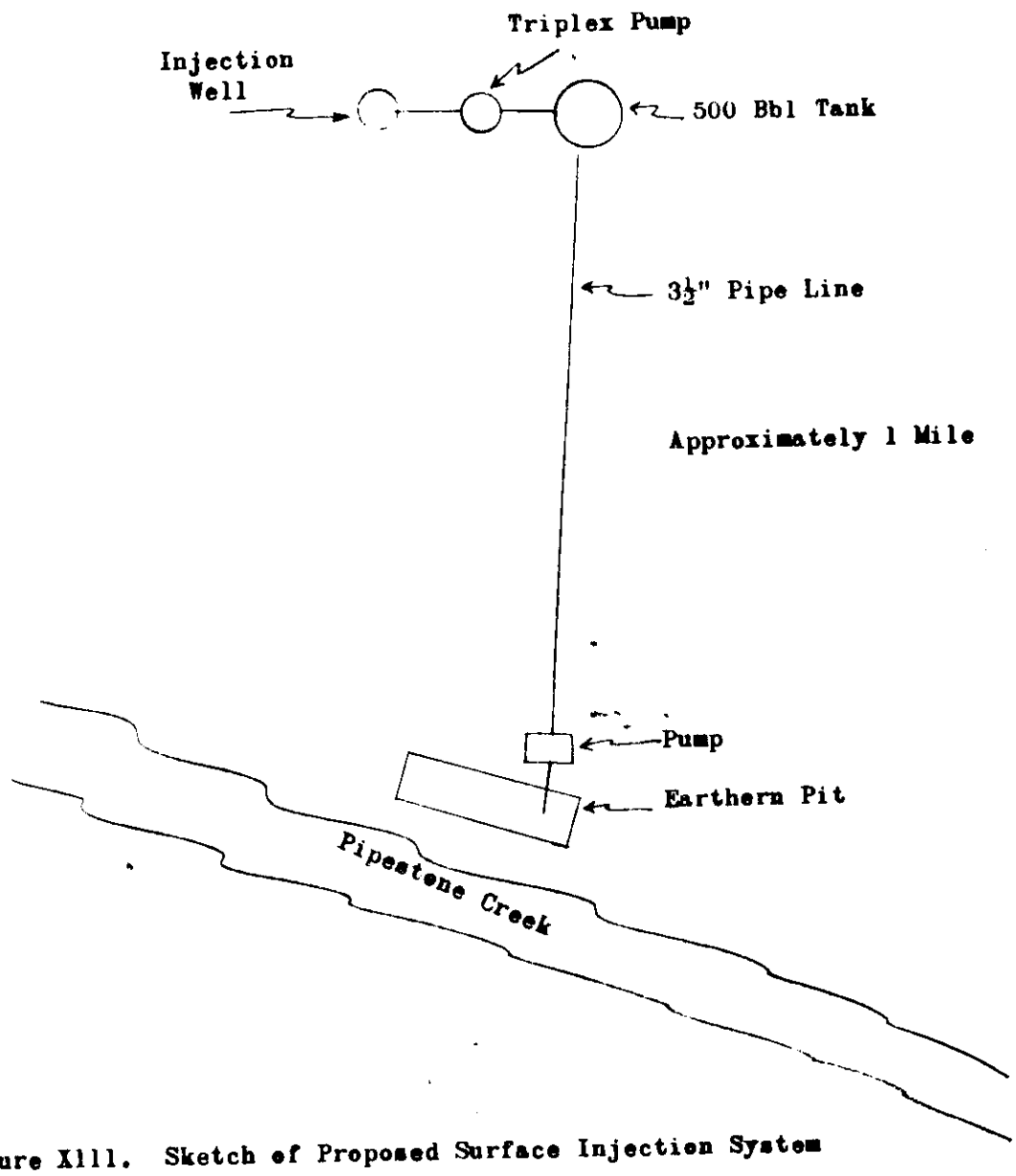



Figure XIII. Sketch of Proposed Surface Injection System

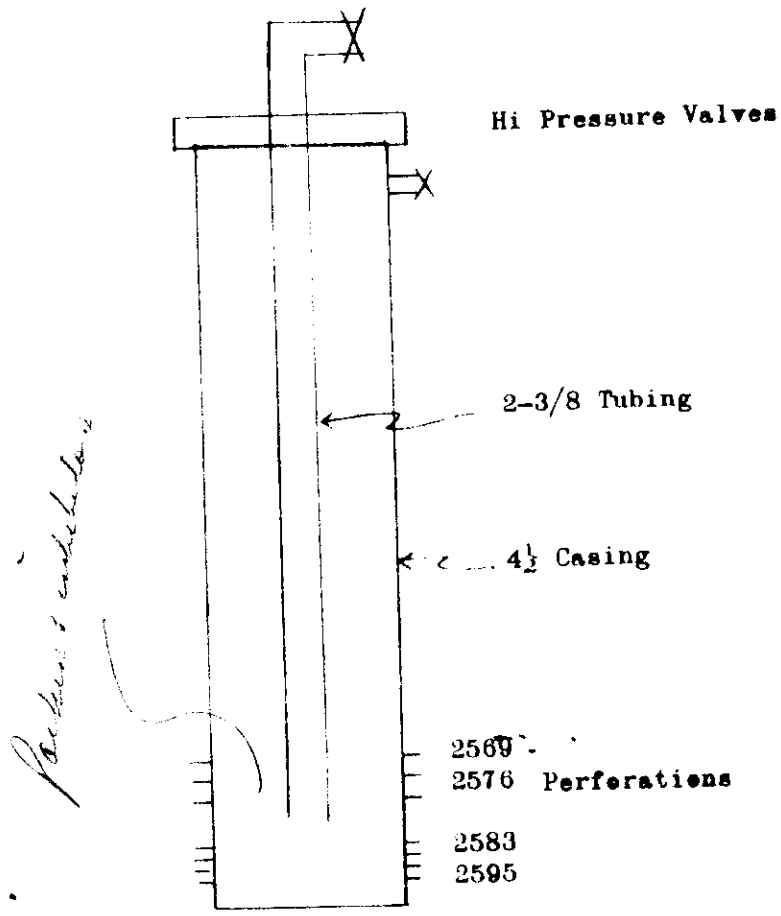



Figure XIV. Sketch of Proposed Injection Well

9-35-2

KB 1730
853
2583

1730
853
2583

| Well No. | Permeability-md Range | Average | Porosity-% | Feet | md Feet | Porosity Feet. |
|---|---|---|---|---|---|---|
| 7-35 | 1-10 | 5 | 11 | 17.3 | 86 | 189 |
| | 10 + | 34 | 12 | 5.7 | 194 | 68 |
| 1-35 | 1-10 | 4.6 | 12 | 15.7 | 72 | 188 |
| | 10 + | 16 | 12 | 8.7 | 140 | 105 |
| 9-35 | 1.0 + | 10 | 12 | 12 | 120 | 144 |
| 11-36 | 1-10 | 4 | 10 | 16.9 | 68 | 170 |
| | 10 + | 36 | 13 | 1.2 | 43 | 16 |
| 13-36 | 1-10 | 3.9 | 10 | 18 | 70 | 180 |
| | 10 + | 24 | 10 | 4.6 | 110 | 46 |
| 5-36 | 1.0 + | 8.3 | 13 | 14 | 116 | 182 |

Figure XV. Summaries of Core Analyses, Ebor Area.

K+E 10 X 10 TO THE ½ INCH 359-11K
KEUFFEL & ESSER CO MADE IN U.S.A.

FIGURE XVI. BOTTOM HOLE PRESSURE DATA

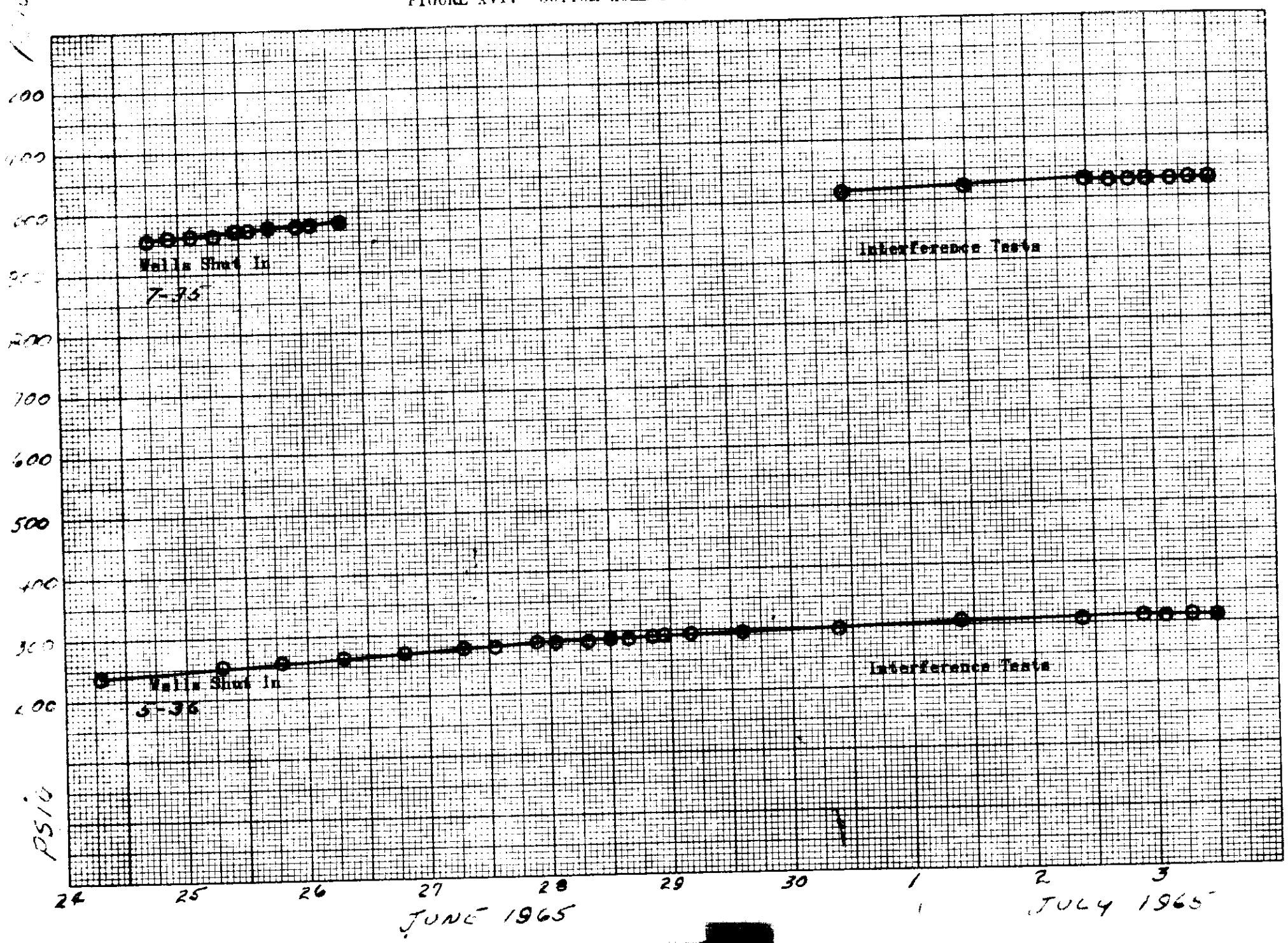


TABLE XVII

## LIST OF WORKING INTEREST OWNERS

S½ Section 36-9-29

Texas Crude Oil Company ✓ OK 100 %
308 - 8th Avenue S.W.
Calgary, Alberta.

E½ Section 35-9-29
NW¼ Section 36-9-29

PARADISE
Paradise Petroleums Ltd., ✓ 50 %
Box #1240
Virden, Manitoba.

Prairie Oil Royalties Company ✓ OK 2/3 of 50 %
805 - 8th Avenue S.W.
Calgary, Alberta.

Vulcan Resources Corporation ✓ OK 1/3 of 50 %
805 - 8th Avenue S.W.
Calgary, Alberta.

**PARADISE PETROLEUMS LTD.**
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA
P.O. BOX ~~XXXX~~ #1240
VIRDEN, MANITOBA

March 8, 1966.

Texas Crude Oil Company,
308 - 8th Avenue S.W.,
Calgary, Alberta.

Gentlemen:

Paradise Petroleums Ltd. is preparing an application to the Minister, Department of Mines and Natural Resources, for permission to conduct a pilot water flood in Sections 35 and 36-9-29 WPM. It is anticipated that Paradise N. Ebor 9-35-9-29 will be used as an injection well for test purposes.

The written consent of working interest owners should be included with the application. If you have no objections to the proposed project, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per: H B Elder

H. B. Elder, P. Engineer.

HBE/dmb.

APPROVED THIS 9 DAY OF MARCH, 1966.

TEXAS CRUDE OIL COMPANY

Per: Donald J. Gfunner

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA
P.O. BOX XXXX
VIRDEN, MANITOBA

March 8, 1966.

Vulcan Resources Corporation
New York City, U.S.A.

Gentlemen:

Paradise Petroleums Ltd. is preparing an application to the Minister, Department of Mines and Natural Resources, for permission to conduct a pilot water flood in Sections 35 and 36-9-29 WPM. It is anticipated that Paradise N. Ebor 9-35-9-29 will be used as an injection well for test purposes.

The written consent of working interest owners should be included with the application. If you have no objections to the proposed project, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per:

H. B. Elder, P. Engineer.

HBE/dmb

APPROVED THIS 14th DAY OF MARCH, 1966.

VULCAN RESOURCES CORPORATION

Per:

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)
736 8TH AVENUE S.W
CALGARY, ALBERTA

P.O. BOX XXXX
VIRDEN, MANITOBA

March 8, 1966.

Prairie Oil Royalties Company Limited,
805 - 8th Avenue S.W.,
Calgary, Alberta.

Gentlemen:

Paradise Petroleums Ltd. is preparing an application to the Minister, Department of Mines and Natural Resources, for permission to conduct a pilot water flood in Sections 35 and 36-9-29 WPM. It is anticipated that Paradise N. Ebor 9-35-9-29 will be used as an injection well for test purposes.

The written consent of working interest owners should be included with the application. If you have no objections to the proposed project, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per:

H. B. Elder, P. Engineer.

HBE/dmb

APPROVED THIS 11 DAY OF MARCH, 1966.

PRAIRIE OIL ROYALTIES COMPANY LIMITED,

Per:

TABLE XVIII

LIST OF ROYALTY INTEREST OWNERS

SE¼ Section 35-9-29

Canada Permanent Trust Company — 1/8
433 Portage Avenue
Winnipeg, Manitoba.

George W. Kurtz, — 1/4 & 1/8 3/8
9004 E. Saanich
Saanichton, B.C.

F. O. Meighen — Meighen Trust #1. — 1/2
119 - 9th Street, (1 consent not received — A.T. Warnock QC, estate)
Brandon, Manitoba.

NE¼ Section 35-9-29

George W. Kurtz, — 1/2
9004 E. Saanich,
Saanichton, B.C.

F. O. Meighen — 1/2
119 - 9th Street,
Brandon, Manitoba.

NW¼ Section 36-9-29

Minister, Department of Mines and Natural Resources, — 100%.
Norquay Building,
Winnipeg, Manitoba. — not received.

SW¼ Section 36-9-29

Walter Russell Grant Norsworthy, — 100%.
Executor of Estate for Walter Scott Norsworthy
Virden, Manitoba.

SE¼ Section 36-9-29

Hugh Cuthbert H. Brayfield, — 1/4
Apt. 305, 117 Bead Drive
Victoria, B. C.

Walter Arnie Kool, — 1/4
Cromer, Manitoba.

Canada Permanent Trust Company — not received. 1/4
433 Portage Avenue
Winnipeg, Manitoba.

Richard Evan Jones, — 1/4
Cromer, Manitoba.

**PARADISE PETROLEUMS LTD.**
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA

P.O. BOX XXXX #1240
VIRDEN, MANITOBA

March 8, 1966

Mr. George W. Kurtz,
9004 E. Saanich,
Saanichton, B. C.

Dear Mr. Kurtz:

As a royalty interest owner under the E½ of Section 35-9-29 WPM, Ebor area, Manitoba, you are undoubtedly aware that producing wells have suffered a rapid production decline. The wells are at, or near, the economic limit of production.

Paradise Petroleums Ltd. is preparing an application to the Minister, Department of Mines and Natural Resources, for permission to conduct a pilot water flood in Section 35 and 36-9-29 with Paradise N. Ebor 9-35-9-29 as the injection well. The purpose of the pilot flood is to determine if sufficient additional oil can be recovered to justify the formation of a waterflood unit.

The written consent of royalty interest owners should be included with the application. If you have no objections, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per:

H. B. Elder, P. Engineer.

HBE/dmb

APPROVED THIS 14 DAY OF MARCH, 1966.

George W. Kurtz.

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA

P.O. BOX ~~1330~~ #1240
VIRDEN, MANITOBA

March 11, 1966

Mr. Richard Evan Jones,
Cromer, Manitoba.

Dear Mr. Jones:

As a royalty interest owner under the SE¼ of Section 36-9-29 WPM, Ebor area, Manitoba, you are undoubtedly aware that producing wells have suffered a rapid production decline. The wells are at, or near, the economic limit of production.

Paradise Petroleums Ltd. is preparing an application to the Minister, Department of Mines and Natural Resources, for permission to conduct a pilot water flood in Section 35 and 36-9-29 with Paradise N. Ebor 9-35-9-29 as the injection well. The purpose of the pilot flood is to determine if sufficient additional oil can be recovered to justify the formation of a waterflood unit.

The written consent of royalty interest owners should be included with the application. If you have no objections, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per: H. B. Elder

H. B. Elder, P. Engineer.

HBE/dmb

APPROVED THIS 12th DAY OF MARCH, 1966.

Richard Evan Jones

Richard Evan Jones.

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA

P.O. BOX 1327
VIRDEN, MANITOBA

March 11, 1966.

Mr. Hugh Cuthbert H. Brayfield,
Apt. 305, 117 Bead Drive,
Victoria, B. C.

Dear Mr. Brayfield:

As a royalty interest owner under the SE¼ of Section 36-9-29 WPM Ebor area, Manitoba, you are undoubtedly aware that producing wells have suffered a rapid production decline. The wells are at, or near, the economic limit of production.

Paradise Petroleums Ltd. is preparing an application to the Minister, Department of Mines and Natural Resources, for permission to conduct a pilot water flood in Section 35 and 36-9-29 with Paradise N. Ebor 9-35-9-29 as the injection well. The purpose of the pilot flood is to determine if sufficient additional oil can be recovered to justify the formation of a waterflood unit.

The written consent of royalty-interest owners should be included with the application. If you have no objections, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per:

H. B. Elder, P. Engineer.

HBE/dmb

APPROVED THIS 17th DAY OF MARCH, 1966.

H C H Brayfield

Hugh Cuthbert H. Brayfield.

**PARADISE PETROLEUMS LTD.**
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA

P.O. BOX X3297 #1240
VIRDEN, MANITOBA

March 11, 1966

Mr. Walter Arnie Kool,
Cromer, Manitoba.

Dear Mr. Kool:

As a royalty interest owner under the SE¼ of Section 36-9-29 WPM, Ebor area, Manitoba, you are undoubtedly aware that producing wells have suffered a rapid production decline. The wells are at, or near, the economic limit of production.

Paradise Petroleums Ltd. is preparing an application to the Minister, Department of Mines and Natural Resources, for permission to conduct a pilot water flood in Section 35 and 36-9-29 with Paradise N. Ebor 9-35-9-29 as the injection well. The purpose of the pilot flood is to determine if sufficient additional oil can be recovered to justify the formation of a waterflood unit.

The written consent of royalty interest owners should be included with the application. If you have no objections, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per: H B Elder

H. B. Elder, P. Engineer.

HBE/dmb

APPROVED THIS 15 DAY OF MARCH, 1966.

Walter A. Kool
Walter Arnie Kool.

**PARADISE PETROLEUMS LTD.**
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA

P.O. BOX ~~0XX~~ #1240
VIRDEN, MANITOBA

March 11, 1966

Mr. Walter Russel Grant Norsworthy,
Executor of the Walter Scott Norsworthy Estate,
Virden, Manitoba.

Dear Mr. Norsworthy:

As a royalty interest owner under the SW¼ of Section 36-9-29 WPM, Ebor area, Manitoba, you are undoubtedly aware that producing wells have suffered a rapid production decline. The wells are at, or near, the economic limit of production.

Paradise Petroleums Ltd. is preparing an application to the Minister, Department of Mines and Natural Resources, for permission to conduct a pilot water flood in Section 35 and 36-9-29 with Paradise N. Ebor 9-35-9-29 as the injection well. The purpose of the pilot flood is to determine if sufficient additional oil can be recovered to justify the formation of a waterflood unit.

The written consent of royalty interest owners should be included with the application. If you have no objections, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per: H. B. Elder

H. B. Elder, P. Engineer.

HBE/dmb

APPROVED THIS 19 DAY OF MARCH, 1966.

Walter Russell Grant Norsworthy,
Executor of the Walter Scott Norsworthy Estate.

Kerr, Meighen & Haddad
Barristers, Solicitors Etc.

N.W. Kerr, Q.C. F.C. Meighen, Q.C.
Joseph Haddad, B.A.LL.B.

Telephone PA 6-5367
119 Ninth Street
Brandon, Man.

Our File No.

Your File No.

April 26, 1966.

Paradise Petroleums Ltd.,
P. O. Box 1327,
Virden, Manitoba.

Dear Sirs:

Re: E½ of Section 35-9-29 Meighen Trust No. 1.

All of the royalty owners for whom the writer acts as trustee have now agreed with the suggestion made in your letter of March 8, with the exception of the estate of A. T. Warnock Q.C. who died about that date at Dauphin. We are attempting to get his estate to consent and when this is received the writer will sign the necessary form.

Yours truly,

KERR, MEIGHEN, HADDAD & CARROLL

Per: F.C. Meighen
J.J.

FOM:mr

# DOWELL OF CANADA

DIVISION OF DOW CHEMICAL OF CANADA, LIMITED

E MAR 27, 66

## CALGARY LABORATORY REPORT

DATE Feb. 16, 1966

C L No. 66-2018

S. No. --

TO E. Lowdon
Virden

TYPE OF SAMPLE Core

DESCRIPTION Core samples from Paradise Petroleums Ebor 7-35 and Ebor 1-35 at depths of 2568-80 and 2561 respectively.

---

The samples were sent in for solubility and swelling tests. The results follow:

| | Ebor 7-35 | Ebor 1-35 |
|---|---|---|
| Solubility in 15X | 82.5% | 78.0% |
| Swelling Tests: | | |
| Relative Volume in Kerosene | 1.0 | 1.0 |
| Relative Volume in Fresh Water | .97 | 1.0 |
| Relative Volume in Fresh Water 0.3M38 | .96 | 1.0 |
| Relative Volume in 10% NaCl | .97 | 1.0 |

No swelling problem would be expected.

Original signed by

F.J. Werth

---

cc: McCallum, Johnson, Ecker, Stewart, Cameron, File.

FIG XIX.

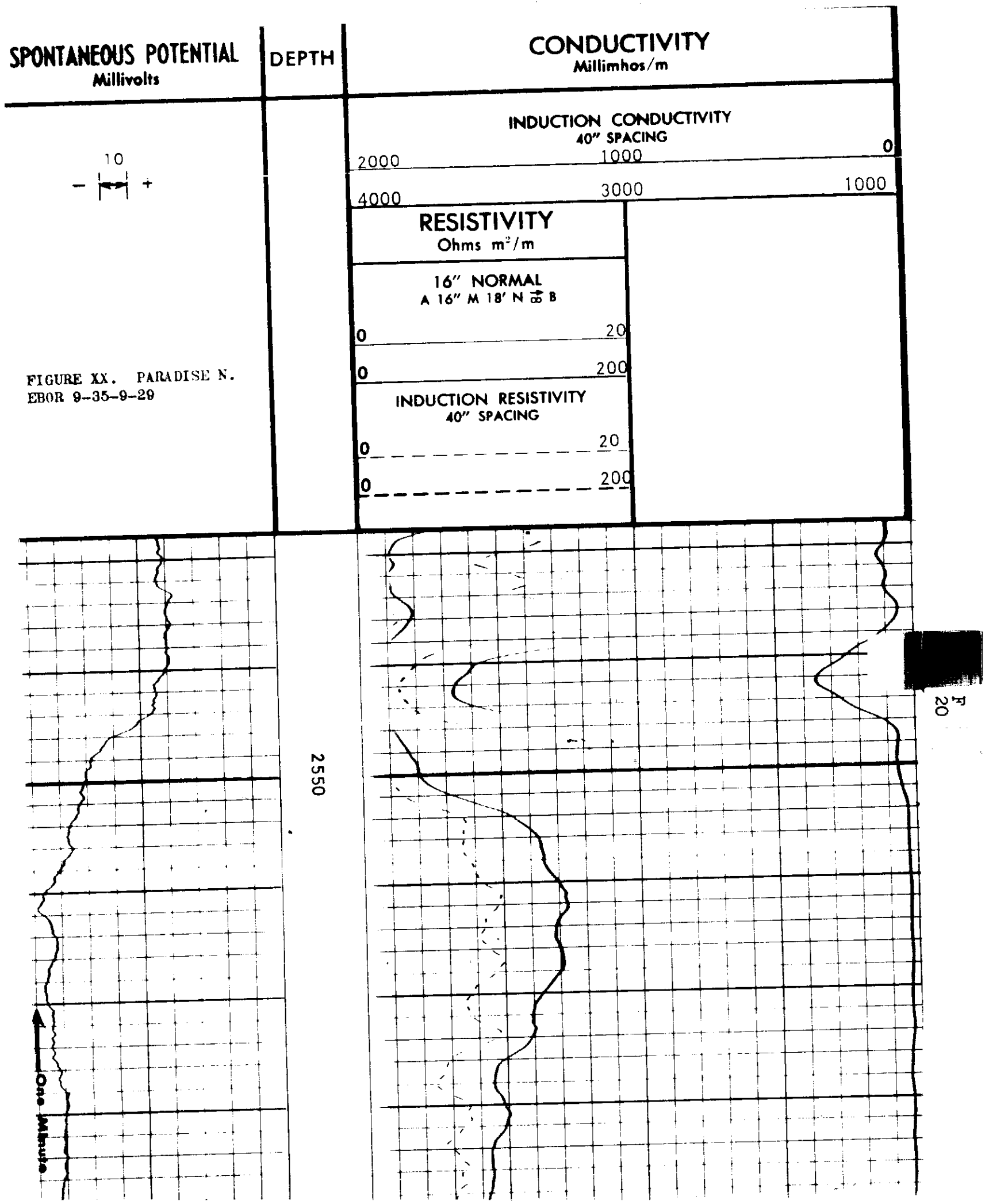



FIGURE XX. PARADISE N.
EBOR 9-35-9-29

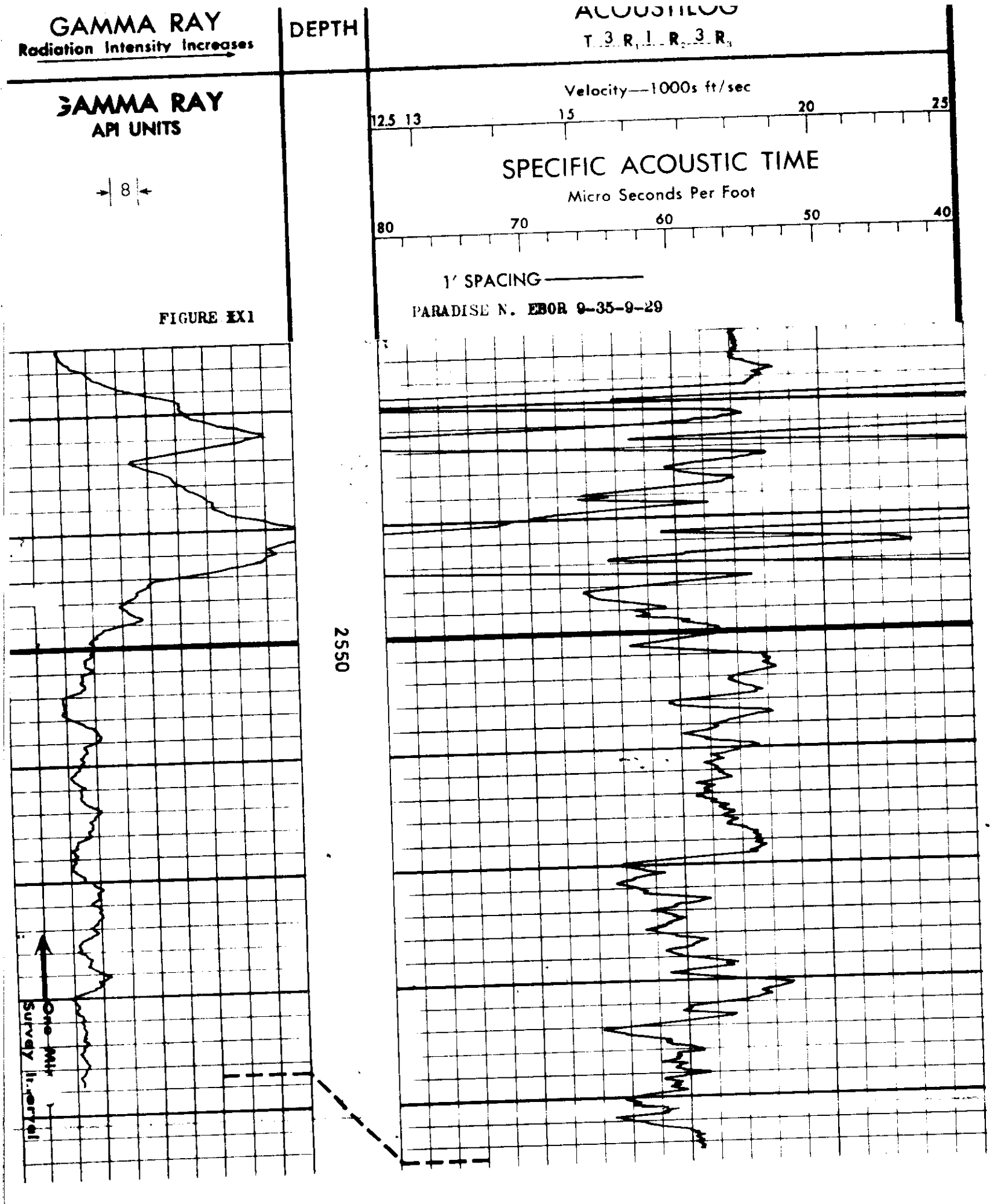

GAMMA RAY
Radiation Intensity Increases
DEPTH
ACOUSTILOG
T 3 R1 1 R2 3 R3
GAMMA RAY
API UNITS
8
Velocity—1000s ft/sec
12.5 13 15 20 25
SPECIFIC ACOUSTIC TIME
Micro Seconds Per Foot
80 70 60 50 40
1' SPACING
PARADISE N. EBOR 9-35-9-29
One Mile
Survey Interval

FIGURE EX1

PETROLEUM DIV.
F. S. GAMEY

ONLY COPIES

Phone 634-3703

P.O. Box 1857

# OLSEN WELL SERVICES LTD.

ESTEVAN, Sask.

## SUBSURFACE PRESSURE SURVEY

Wells: (1) Paradise Petroleums 7-35

(2) Texas Crude 5-36

Location: (1) L.S.D. 7-35-9-29 W1

(2) L.S.D. 5-36-9-29 W1

Date: June 24 to July 3, 1965

Phone 634-3703 P.O. Box 1857

# OLSEN WELL SERVICES LTD.

ESTEVAN, Sask.

## SUBSURFACE PRESSURE BUILD-UP

Well: Texas Crude 5-36
Location: L.S.D. 5-36-9-29 W2
Run Depth: 2515 ft. C.F.

Date: June 24 to 27, 1965
B.H. Temperature: 82°F.
Gauge: #19406N

Remarks

Gauge left at safe run depth (2515 ft. C.F.) for approx. 67.6 hours

| DATE | TIME | PRESSURE P.S.I.G. |
|---|---|---|
| June 24, 1965 | 7:10 pm | 236 |
| June 25, 1965 | 7:10 am | 251 |
| | 7:10 pm | 258 |
| June 26, 1965 | 7:10 am | 265 |
| | 7:10 pm | 272 |
| June 27, 1965 | 7:10 am | 279 |
| | 2:50 pm | 279 |

G 9-104

20 Divisions per Inch Both Ways. 140 by 200 Divisions

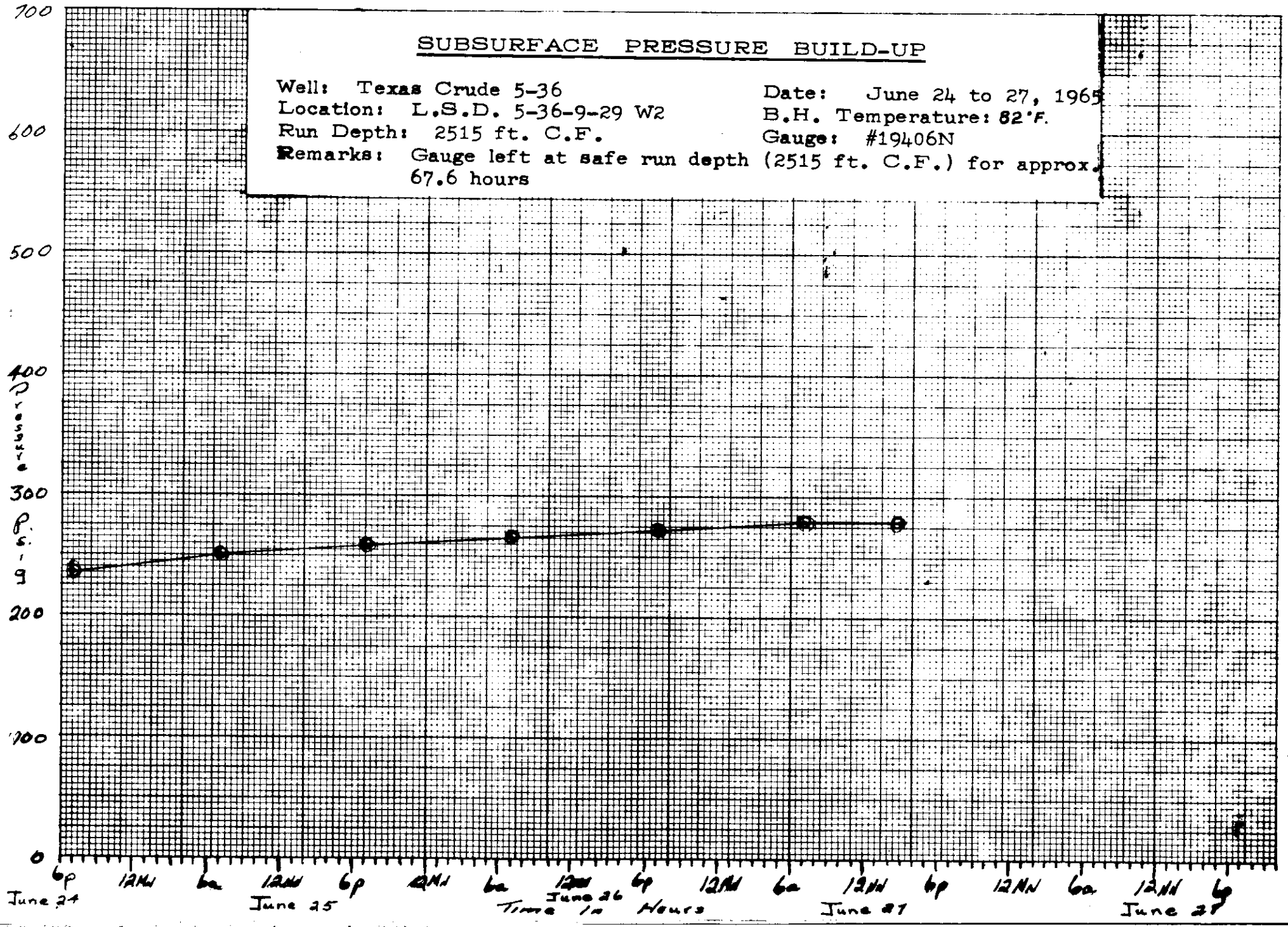
MADE IN CANADA

MICRO RAPID

# SUBSURFACE PRESSURE BUILD-UP

Well: Texas Crude 5-36
Location: L.S.D. 5-36-9-29 W2
Run Depth: 2515 ft. C.F.
Remarks: Gauge left at safe run depth (2515 ft. C.F.) for approx. 67.6 hours

Date: June 24 to 27, 1965
B.H. Temperature: 82°F.
Gauge: #19406N



Phone 634 370.3

P.O. Box 1857

# OLSEN WELL SERVICES LTD.

ESTEVAN, Sask.

## SUBSURFACE PRESSURE BUILD-UP

Well: Texas Crude 5-36
Location: L.S.D. 5-36-9-29 W1
Run Depth: 2515 ft. C.F.

Date: June 27 to 29, 1965
B.H. Temperature: 82°F
Gauge: #19406N

Remarks:
Gauge left at safe run depth (2515 ft. C.F.) for 40.5 hours

| DATE | TIME | PRESSURE P.S.I.G. |
|---|---|---|
| June 27 | 9:30 pm | 283 |
| June 28 | 1:30 am | 285 |
| | 5:30 am | 286 |
| | 9:30 am | 288 |
| | 1:30 pm | 289 |
| | 5:30 pm | 291 |
| | 9:30 pm | 292 |
| June 29 | 5:30 am | 294 |
| | 2:00 pm | 297 |

G 9-10½

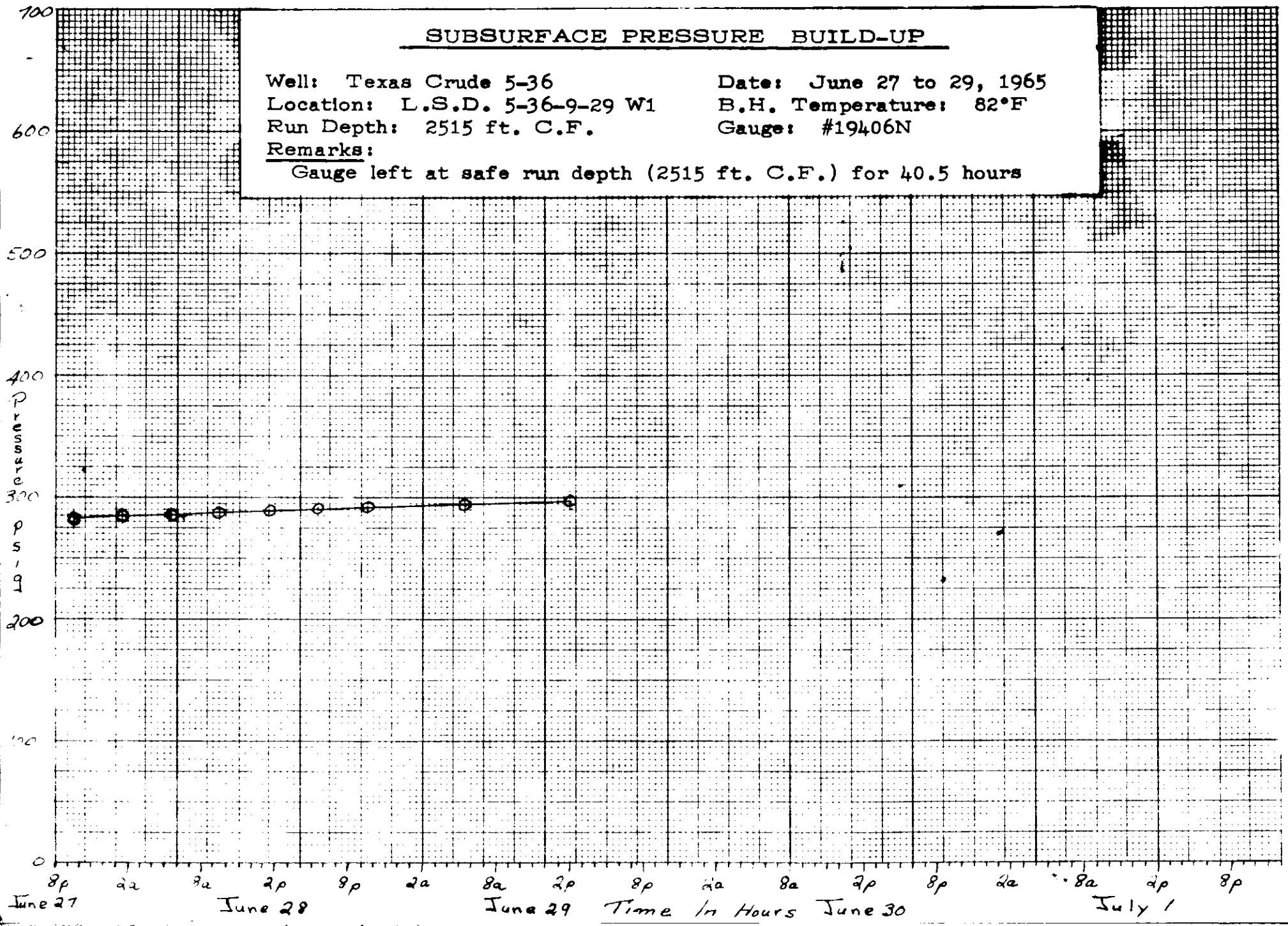
20 Divisions per Inch Both Ways. 140 by 200 Divisions.
MADE IN CANADA

CCES MICROGRAPH

# SUBSURFACE PRESSURE BUILD-UP

Well: Texas Crude 5-36
Location: L.S.D. 5-36-9-29 W1
Run Depth: 2515 ft. C.F.
Date: June 27 to 29, 1965
B.H. Temperature: 82°F
Gauge: #19406N

Remarks:
Gauge left at safe run depth (2515 ft. C.F.) for 40.5 hours



Phone 634 3703

P.O. Box 1857

# OLSEN WELL SERVICES LTD.

ESTEVAN, Sask.

## INTERFERENCE TEST

Well: Texas Crude 5-36
Location: L.S.D. 5-36-9-29 W1
Run Depth: 2515 ft. C.F.

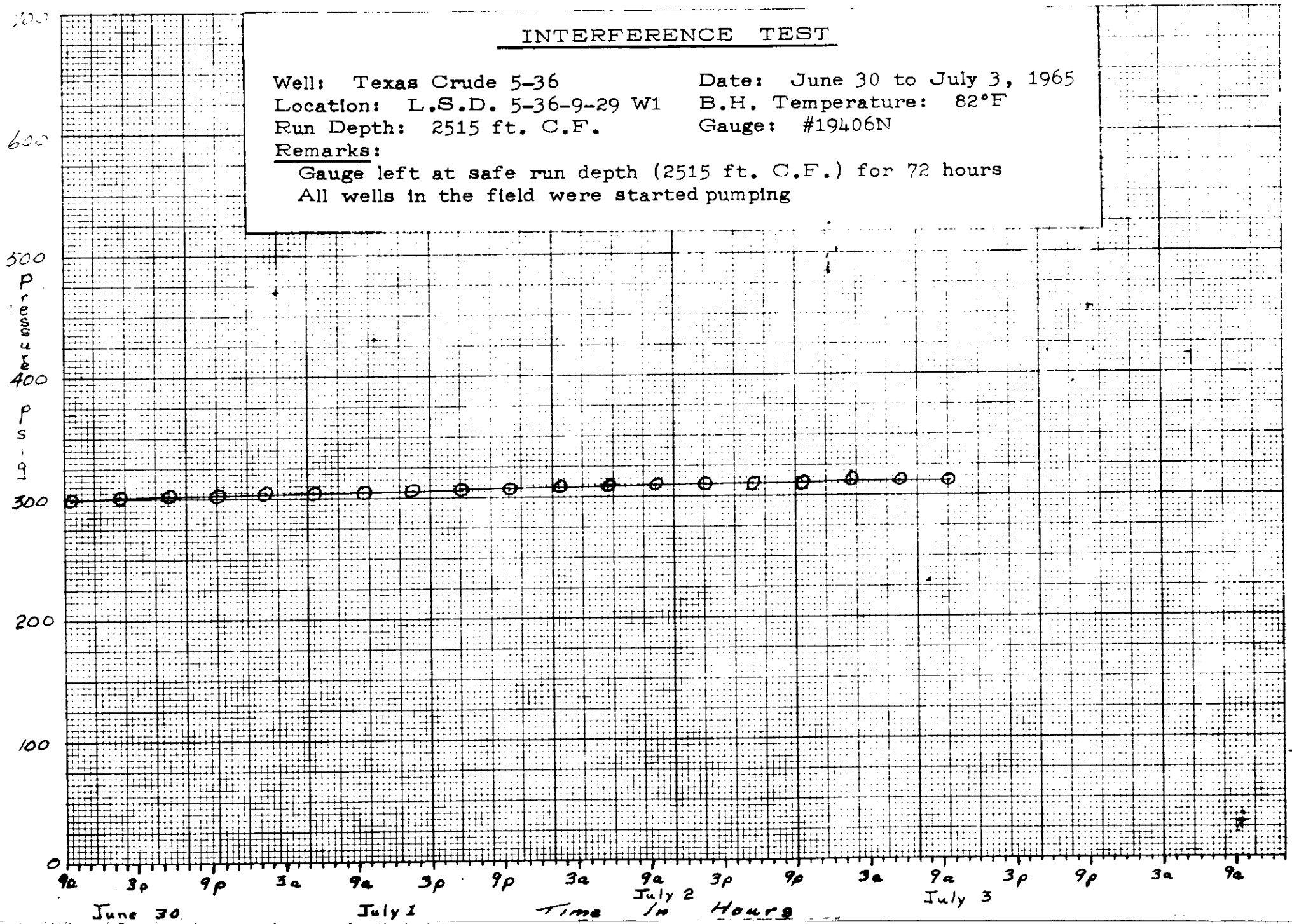
Date: June 30 to July 3, 1965
B.H. Temperature: 82°F
Gauge: 19406N

Remarks:

Gauge left at safe run depth (2515 ft. C.F.) for 72 hours
All wells in the field were started pumping

| DATE | TIME | PRESSURE P.S.I.G. |
|---|---|---|
| June 30, 1965 | 9:35 am | 299 |
| | 1:35 pm | 301 |
| | 5:35 pm | 302 |
| | 9:35 pm | 302 |
| July 1, 1965 | 1:35 am | 303 |
| | 5:35 am | 304 |
| | 9:35 am | 305 |
| | 1:35 pm | 306 |
| | 5:35 pm | 307 |
| | 9:35 pm | 307 |
| July 2, 1965 | 1:35 am | 308 |
| | 5:35 am | 309 |
| | 9:35 am | 310 |
| | 1:35 pm | 310 |
| | 5:35 pm | 311 |
| | 9:35 pm | 312 |
| July 3, 1965 | 1:35 am | 312 |
| | 5:35 am | 312 |
| | 9:35 am | 312 |

2


INTERFERENCE TEST
Well: Texas Crude 5-36
Location: L.S.D. 5-36-9-29 W1
Run Depth: 2515 ft. C.F.
Date: June 30 to July 3, 1965
B.H. Temperature: 82°F
Gauge: #19406N
Remarks:
Gauge left at safe run depth (2515 ft. C.F.) for 72 hours
All wells in the field were started pumping
Pressure psig
700
600
500
400
300
200
100
0
9a
3p
9p
3a
9a
3p
9p
3a
9a
3p
9p
3a
9a
3p
9p
3a
9a
June 30
July 1
July 2
July 3
Time in Hours

Phone 634-3703 P.O. Box 1857

# OLSEN WELL SERVICES LTD.

ESTEVAN, Sask.

## SUBSURFACE PRESSURE SURVEY

Well: Paradise Petroleum 7-35
Location: L.S.D. 7-35-9-29 W1
Run Depth: 2543 ft. C.F.

Date: June 24 to 27, 1965
B.H. Temperature: 82°F
Gauge: #22467N

Remarks:

Gauge at safe run depth (2543 ft. C.F.) for 38 hours.
The wire parted after 38 hours in the hole.
When the bomb was recovered only 38 hours of pressure was recorded.

| DATE | TIME | PRESSURE P.S.I.G. |
|---|---|---|
| June 24, 1965 | 6:10 pm | 956 |
| | 10:10 pm | 960 |
| June 25, 1965 | 2:10 am | 963 |
| | 6:10 am | 967 |
| | 10:10 am | 970 |
| | 2:10 pm | 972 |
| | 6:10 pm | 975 |
| | 10:10 pm | 977 |
| June 26, 1965 | 2:10 am | 978 |
| | 8:10 am | 982 |

G 9-1014

20 Divisions per Inch Both Ways. 140 by 200 Divisions.

MADE IN CANADA

CCBS MICROGRAPH

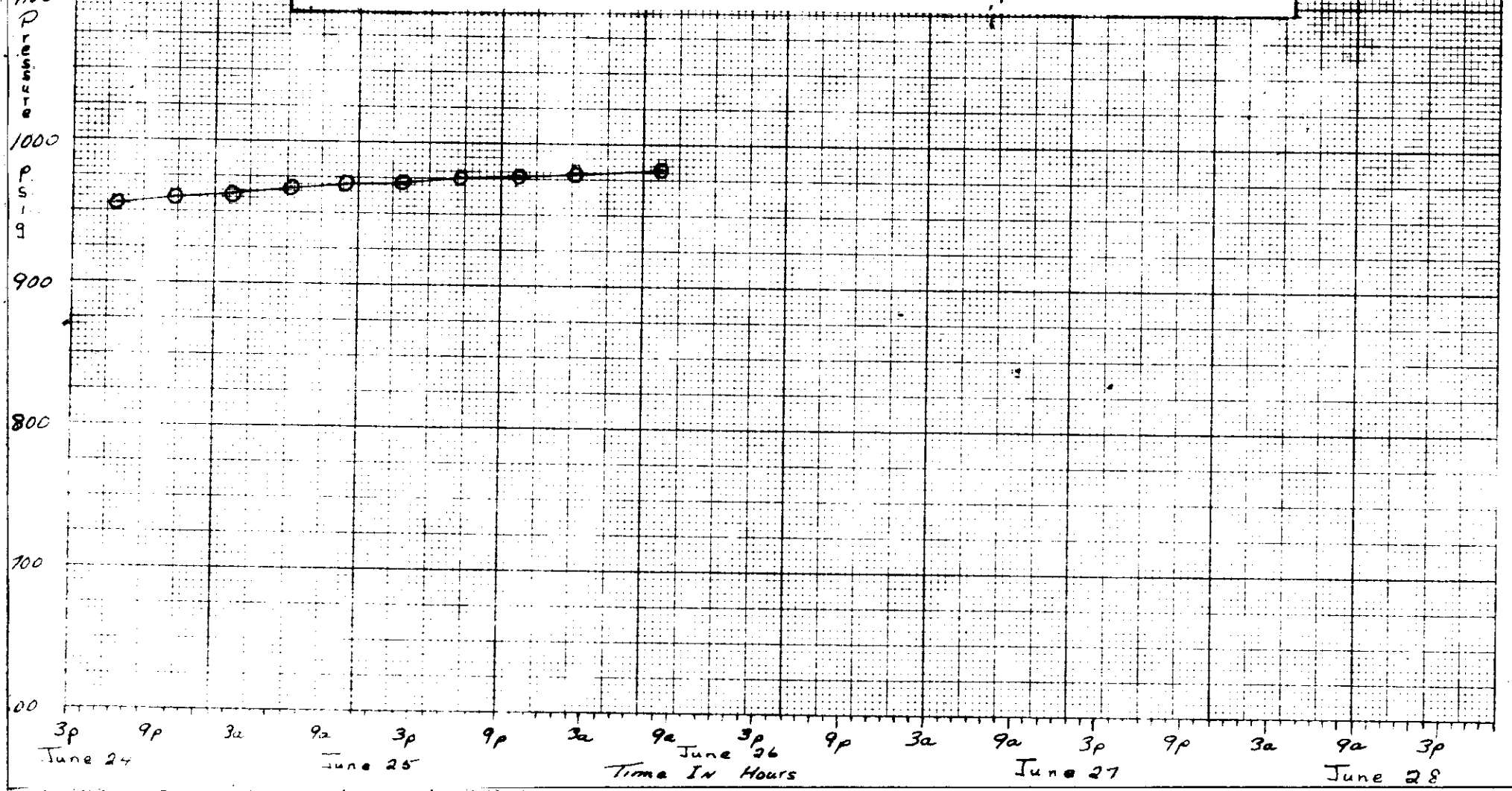
# SUBSURFACE PRESSURE SURVEY

Well: Paradise Petroleum 7-35
Location: L.S.D. 7-35-9-29 W1
Run Depth: 2543 ft. C.F.

Date: June 24 to 27, 1965
B.H. Temperature: 82°F
Gauge: #22467N

Remarks:

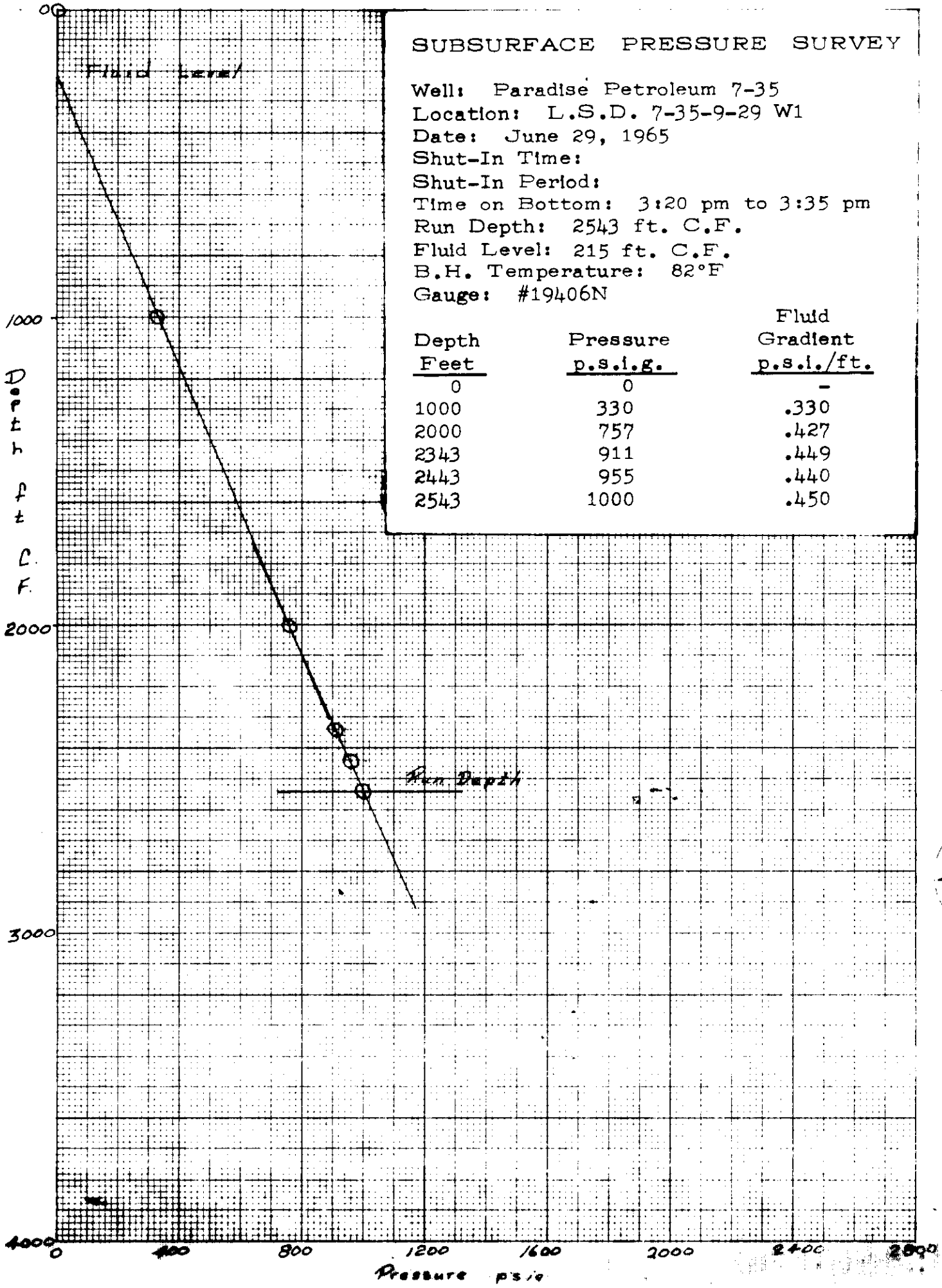
Gauge at safe run depth (2543 ft. C.F.) for 38 hours
The wire parted after 38 hours in the hole
When the bomb was recovered only 38 hours of pressure was recorded.



# SUBSURFACE PRESSURE SURVEY

Well: Paradise Petroleum 7-35
Location: L.S.D. 7-35-9-29 W1
Date: June 29, 1965
Shut-In Time:
Shut-In Period:
Time on Bottom: 3:20 pm to 3:35 pm
Run Depth: 2543 ft. C.F.
Fluid Level: 215 ft. C.F.
B.H. Temperature: 82°F
Gauge: #19406N

| Depth Feet | Pressure p.s.i.g. | Fluid Gradient p.s.i./ft. |
|---|---|---|
| 0 | 0 | - |
| 1000 | 330 | .330 |
| 2000 | 757 | .427 |
| 2343 | 911 | .449 |
| 2443 | 955 | .440 |
| 2543 | 1000 | .450 |




Divisions per Inch Both Axes 140 by 200 Divisions

Phone 634-5703

P.O. Box 1857

# OLSEN WELL SERVICES LTD.

ESTEVAN, Sask.

## INTERFERENCE TEST

Well: Paradise Petroleum 7-35
Location: L.S.D. 7-35-9-29 W1
Run Depth: 2543 ft. C.F.
Remarks:

Date: June 30 to July 3, 1965
B.H. Temperature: 82°F
Gauge: 22513N

Gauge left at safe run depth (2543 ft. C.F.) for 72 hours

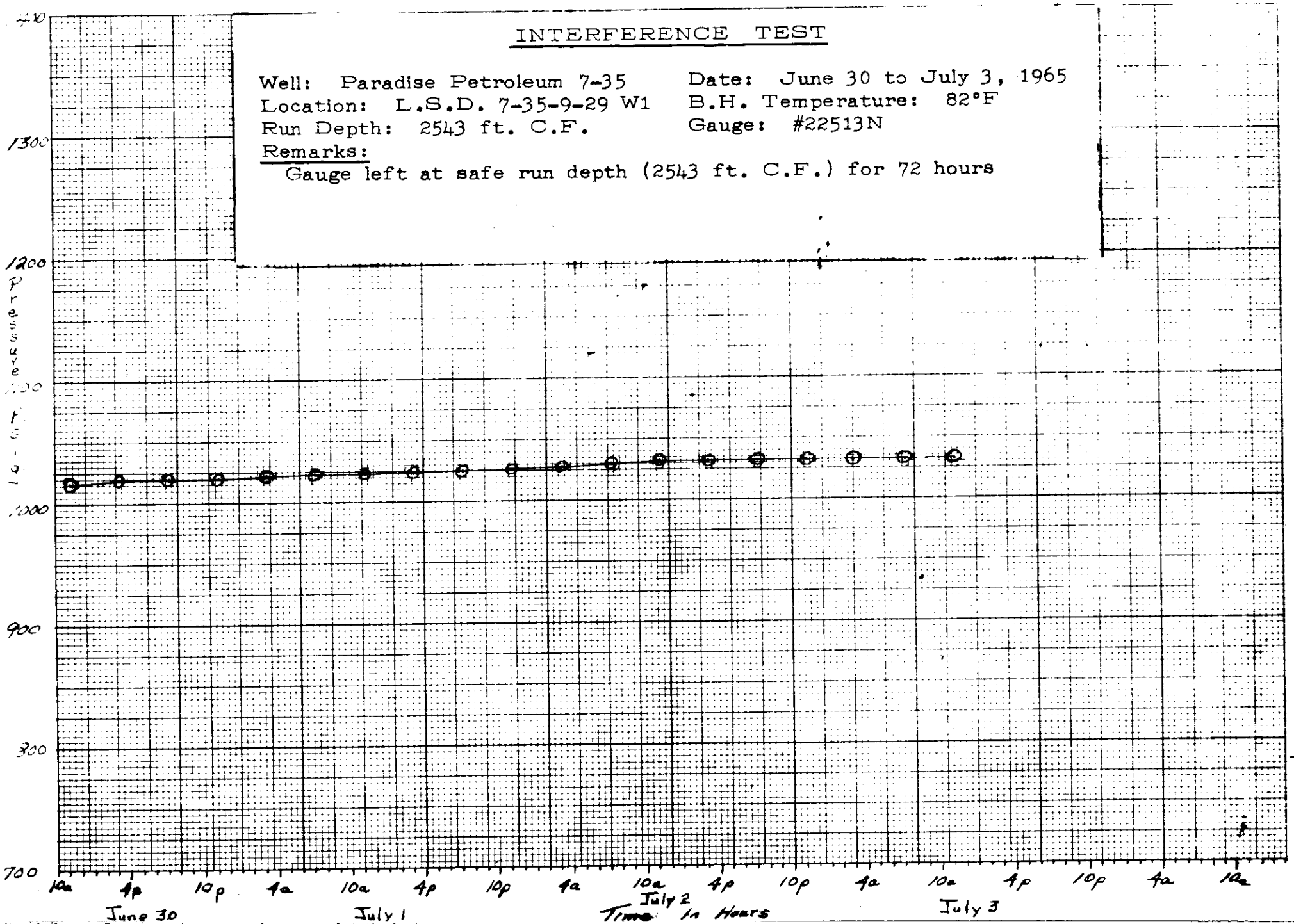
| DATE | TIME | PRESSURE P.S.I.G. |
|---|---|---|
| June 30, 1965 | 11:15 am | 1016 |
| | 3:15 pm | 1019 |
| | 7:15 pm | 1019 |
| | 11:15 pm | 1020 |
| July 1, 1965 | 3:15 am | 1022 |
| | 7:15 am | 1023 |
| | 11:15 am | 1023 |
| | 3:15 pm | 1024 |
| | 7:15 pm | 1025 |
| | 11:15 pm | 1026 |
| July 2, 1965 | 3:15 am | 1027 |
| | 7:15 am | 1030 |
| | 11:15 am | 1032 |
| | 3:15 pm | 1032 |
| | 7:15 pm | 1032 |
| | 11:15 pm | 1032 |
| July 3, 1965 | 3:15 am | 1032 |
| | 7:15 am | 1032 |
| | 11:15 am | 1032 |

# INTERFERENCE TEST

Well: Paradise Petroleum 7-35
Location: L.S.D. 7-35-9-29 W1
Run Depth: 2543 ft. C.F.

Date: June 30 to July 3, 1965
B.H. Temperature: 82°F
Gauge: #22513N

Remarks:
Gauge left at safe run depth (2543 ft. C.F.) for 72 hours



**DEPARTMENT OF MINES AND NATURAL RESOURCES**
**ROUTE SLIP**

| | |
|---|---|
| | FROM |
| | FROM |

| | | |
|---|---|---|
| or your approval or revision | ☐ Reply direct with copy to me | ☐ Please sign |
| or your information | ☐ Please supply data for my reply | ☐ Please return |
| lease take action | ☐ Return with comments and/or recommendations | ☐ Please see me |
| xtracts of minutes for your formation and action | ☐ Investigate and report | ☐ Please phone |

lease draft reply for signature of [illegible] 2.3 times water density

[illegible] Subject Bottom hole pressure expected at .5 to 1.7 x depth (fresh)

age Well depth = 6050' to top of pay.

[illegible] @ 3125 psi. 2 units operating

High Voidage at Start of flood { 1 million bbl per 80 acre 5 spot

Large volume of water required.

High injection pressures required to maintain high rate of injection. [illegible] pressure [illegible]

IR-A-94 Use reverse side if necessary

# High Pressure Waterflood Halts Rapid Decline

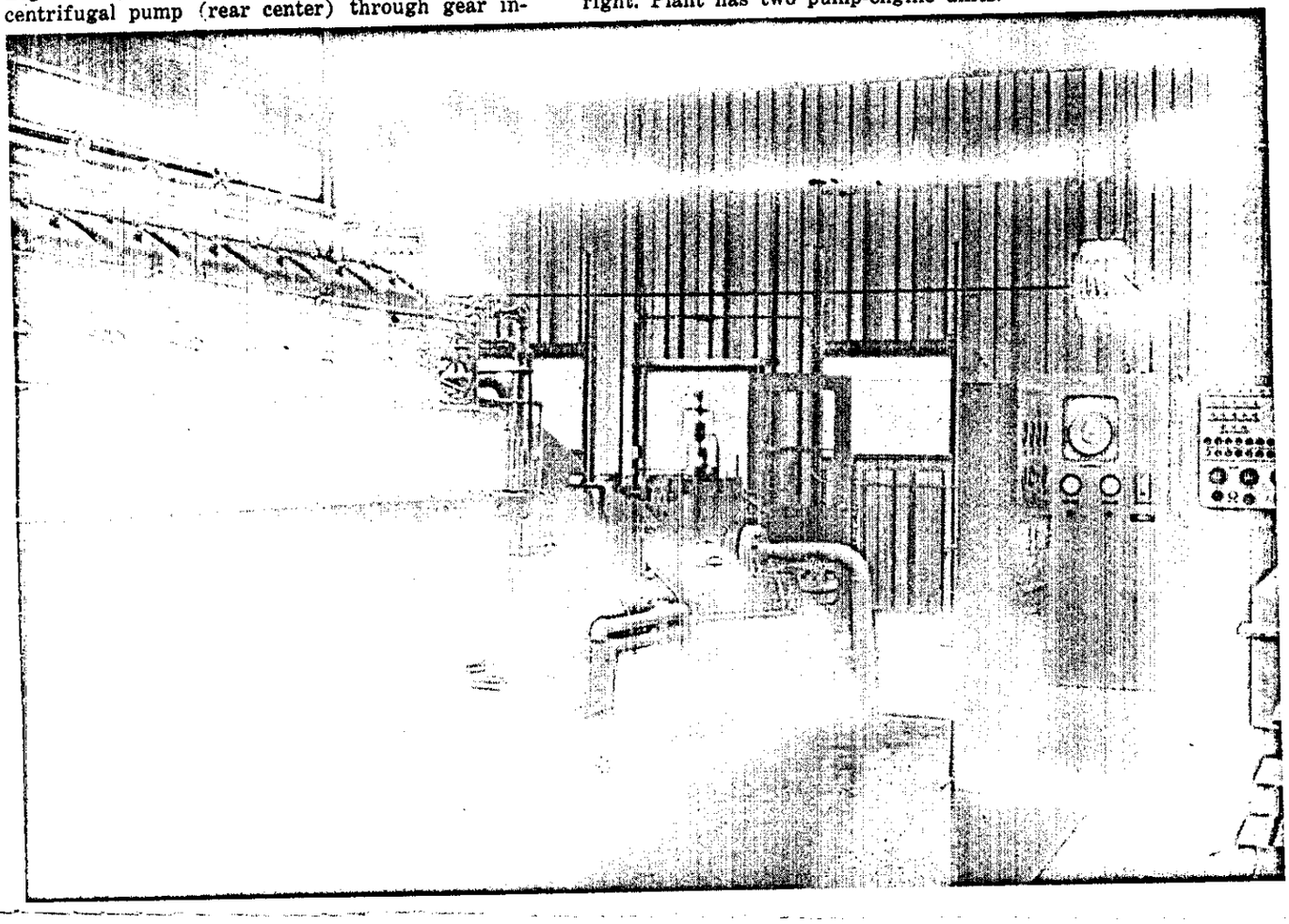
by Tom Covington and Fred Wilcox
*Perkins-Prothro Co. Wichita Falls, Tex.*

If halting a 30% annual production decline in a difficult reservoir is any criteria, Perkins-Prothro Co. as operators, can call their joint project with Pennzoil Co. in the Jameson Strawn field of Coke County, Tex., a success. Two special-designed engine-powered centrifugal pumps provided the needed injection pressure and rates to continue retarding production decline when previous injection of 20,000 bpd at 2500 psi appeared to be loosing ground.

Each of the two new pumps is capable of handling 22,000 bpd at a differential pressure of 3500 psi with a maximum working pressure of 4500 psi. At this writing, both units are injecting 42,000 bpd at 3125 psi discharge pressure. This volume of water is all that is available at this time. As injection pressures increase to maintain this higher rate, it will be necessary to add booster pumps to reach eventually the 4500 psi discharge pressure for which the pumps were designed.

Some idea of the difficult nature of the reservoir may be found in the reservoir characteristics. Permeabilities of the interconnecting sandstones lenses average only 0.8 millidarcy with the bulk of the 69-ft net pay (varies from 10 to 100 ft) in the order of 0.1 to 0.2 md. Core analysis shows an average porosity of 12.2%, average water saturation of 43.9% and average residual oil saturation of 10.0%. Ultimate primary oil recovery is

Big V-16 cylinder engine at left drives high-speed centrifugal pump (rear center) through gear increaser. Operating and safeguard controls are at right. Plant has two pump-engine units.



calculated to be 7% of the stock tank oil in-place.

The waterflood project described here was installed on the operator's W. C. Blanks lease. Original water injection efforts commenced in October 1959, helped to retard declining production, but, later proved to be inadequate due to limitation of injection rates.

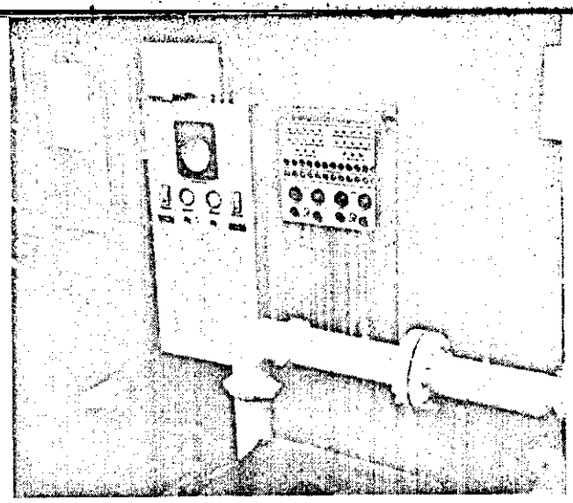
Oil production for the lease in May 1956, amounted to about 100,000 bbl for the month. By mid-1959, production had dropped to 20,000 bbl per month. Extrapolated decline shows that without water injection, production could be expected to drop to less than 10,000 bbl per month by mid-1965. Instead, the original water injection program was started in October 1959, and oil production was maintained around 25,000 bbl per month. With the advent of higher injection pressures and higher rates, available from the new high-pressure, high-volume pump, oil production appears to be increasing from 28,000 bbl/month.

## Background of Project

The first Jameson Strawn field well was completed on May 11, 1949, as a marginal producer pumping four bpd. Drilling was stopped until February 1952, when a flush-flowing producer was completed, and development proceeded rapidly. At present, there are 521 oil producing wells in the Jameson Strawn field which covers some 27,500 productive acres. From February 1952, until May 1, 1965, the field has produced nearly 28 million bbls of oil for an average recovery per well of 53,613 bbls and an average recovery per productive acre of 1016 bbls.

The producing formation in the Jameson Strawn field is a body of inter-connecting sandstone lenses occurring in approximately 200 ft of Pennsylvania section topped at about 6050 ft. The lenses pinch-out or shale-out updip to the east on the Jameson Strawn Reef field. From the eastern limit, they dip fairly uniformly to the west at a rate of about 150 ft per mile. The Jameson Strawn Reef at its crest is built up into and through the sand section. The sand section thickens rapidly west of the reef crest. The west, north and south limits of the sand are delineated by shale-outs. The reservoir rock is a tan-to-gray fine-grained sandstone with varying amounts of dark gray to black shale partings. The grains are angular to sub-angular, well sorted and are cemented with varying amounts of silica and anhydrite.

The major structural feature of the reservoir is a westward plunging monocline from a crest of the Jameson Strawn Reef field. In this crest area there are several localized gas caps. The



Control brain of pump station are these supervisory operating controls. At left is pneumatic controls for pressure-volume limits; at right are electronic controls for temperature limitations throughout plant.

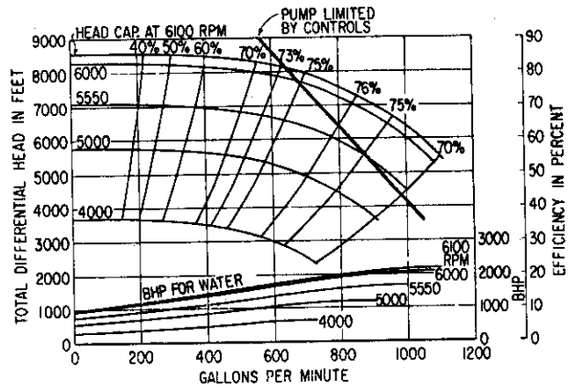



Fig. 1. Performance curves for newly-designed 3 x 8-in. 10-stage centrifugal pumps. Pneumatic controls limit pump output (indicated by heavy sloping line) to the maximum brake hp available from engines.

gas-oil contact has been established at a subsea depth of —3829 ft. A known oil-water contract has not been established on the structurally low west edge of the monocline.

Reservoir fluid of the Jameson Strawn sand is a high gravity saturated crude oil. 60 F API gravity is 49 deg. A reservoir fluid sample showed the crude oil to have 1530 cu ft per bbl of solution gas with a bubble point of 2673 psi. At 2673 psi, the crude oil had a formation volume factor of 1.860. The reservoir has a solution gas drive. Its performance has been marked by high gas-oil ratios which could be expected from a tight sand reservoir and a high solution gas crude oil.

## Early Waterflood Efforts

Perkins-Prothro Co. and Pennzoil Co. own 9115 acres of which 7772 acres are productive and include 155 wells. Due to the low permeability of the reservoir, the first question

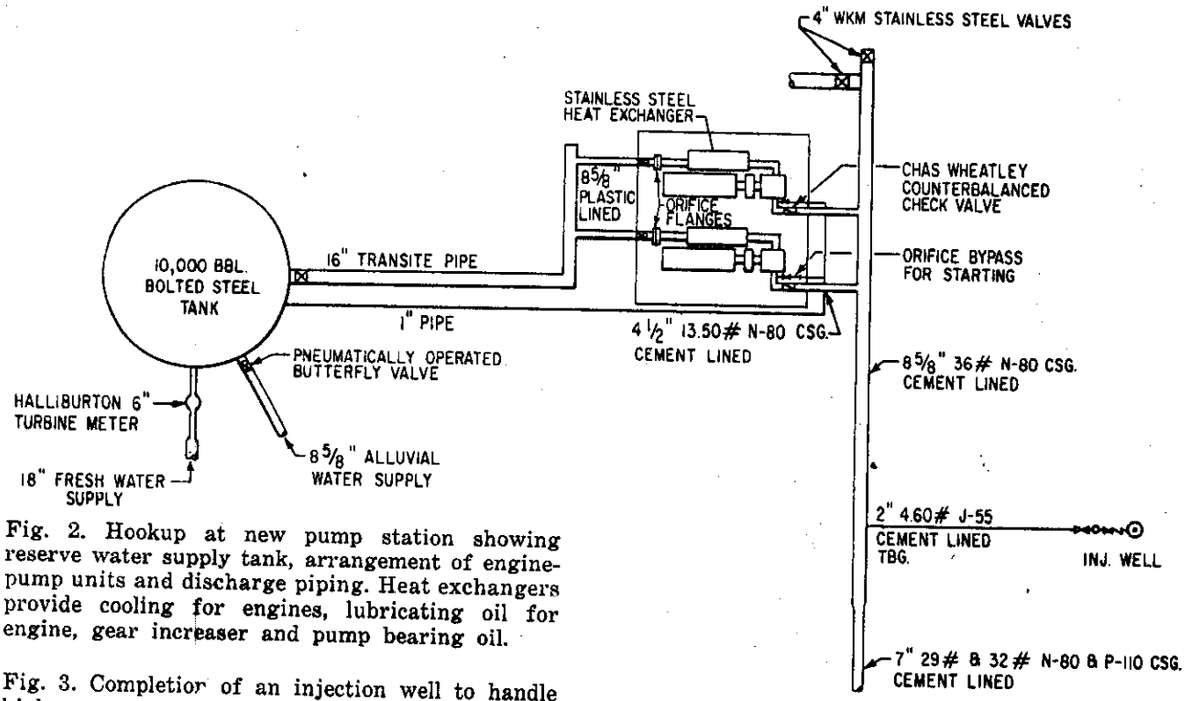



Fig. 2. Hookup at new pump station showing reserve water supply tank, arrangement of engine-pump units and discharge piping. Heat exchangers provide cooling for engines, lubricating oil for engine, gear increaser and pump bearing oil.

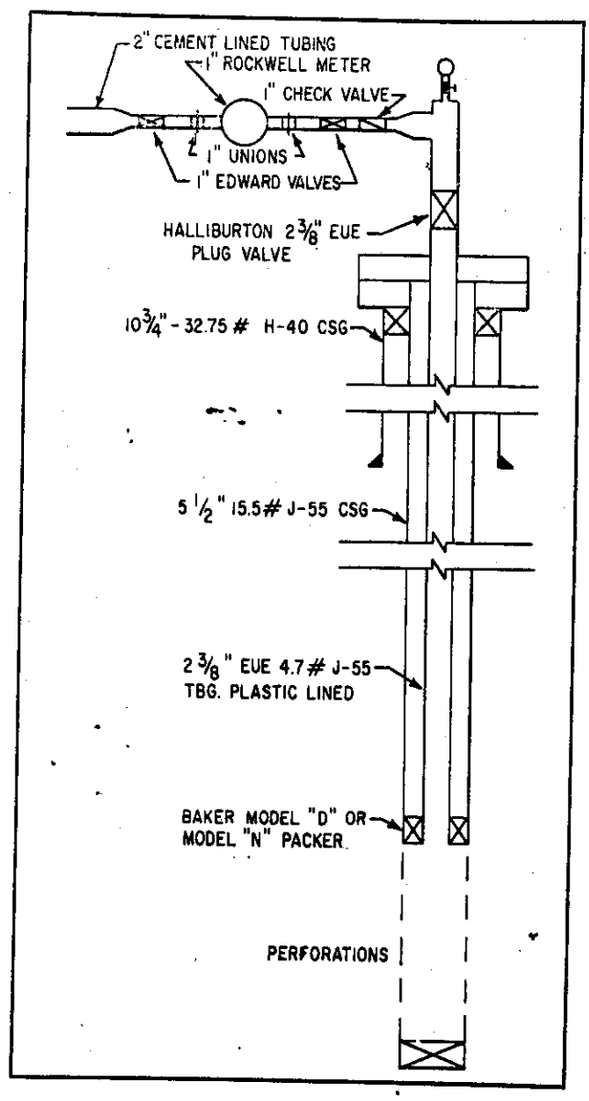



Fig. 3. Completion of an injection well to handle high pressures. Water is metered through a 1-in. turbine-type meter and injected down 2⅜-in. plastic-lined J-55 tubing below packer.

unanswered was whether a sufficient volume of water could be injected into the reservoir at a reasonable pressure. A producing well was converted for water injection on Sept. 1, 1957, and water injected into this well until Sept. 1, 1958. During this time, a total of 202,109 bbls of water were injected at a maximum pressure of 2000 psi. Tracer logs were run during injection which indicated approximately 81.2% of the sand was receiving water. Offset wells indicated slight production increases during water injection and tapered off after the project was shut down.

On Oct. 1, 1959, waterflood operations were commenced in the Jameson Strawn by Perkins-Prothro Co. and Pennzoil Co.

The first water pumping station consisted of nine 115-hp engines and nine pumps with a total capacity of 20,000 bpd at a discharge pressure of 2500 psi. Initial oil increases were noted in approximately two months following initial injection. However, these increases did not hold up. Since then, four additional waterflood projects have been initiated.

## Water Source

The first injection water was produced from the Cisco formation. It was highly corrosive and necessitated protection of all metal surfaces by either cement lining or plastic coating. Parts that could not be coated were made of

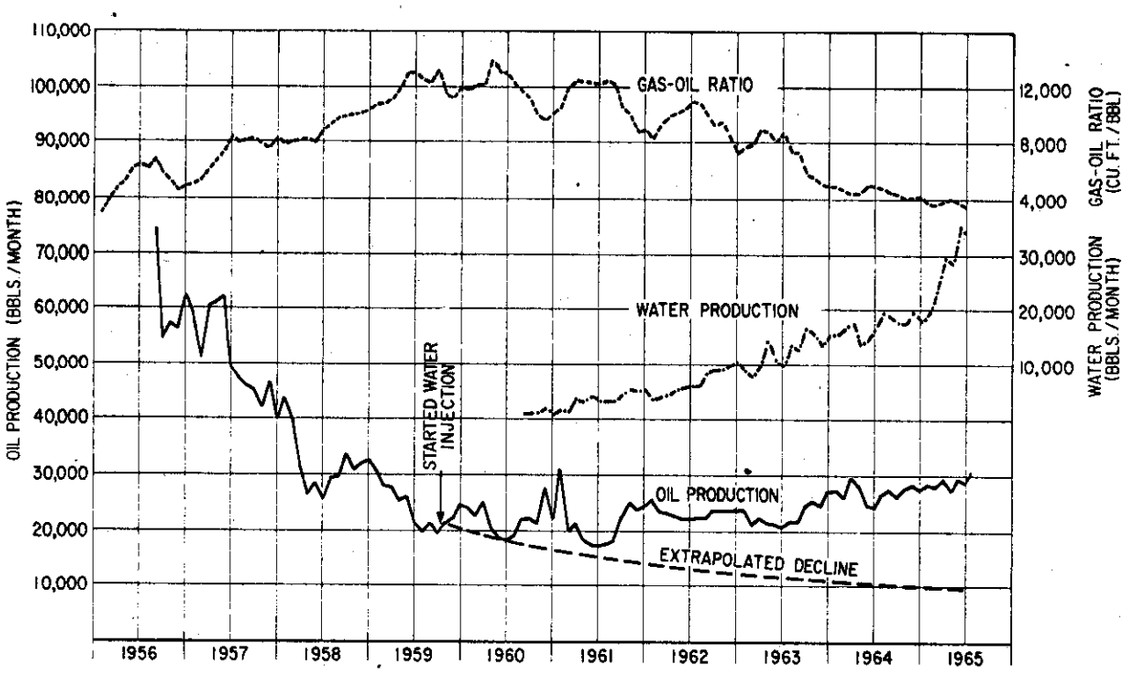



**Fig. 4.** Production history of the W. C. Blanks lease of the Jameson Strawn field where a high-pressure water injection program initiated in 1959 halted the extrapolated oil production decline of this lease.

aluminum bronze, stainless steel or Monel. A total of four wells were drilled for water supply. One of the wells testing the Cambrian sand at 8000 ft was dry.

During February 1962, alluvial water supply was developed along the Colorado River with a capacity of 15,000 to 20,000 bpd. At this time, the Cisco water supply was shut down. This alluvial supply was sufficient until the new plant was installed in December 1964. Additional water was obtained from The Colorado River Municipal Water District from Lake J. B. Thomas and treated in Sun Oil Co.'s plant at Silver, Tex. Volume contracted for is 25,000 bpd to be increased later to 35,000 bpd.

## Analysis of Injection Problem

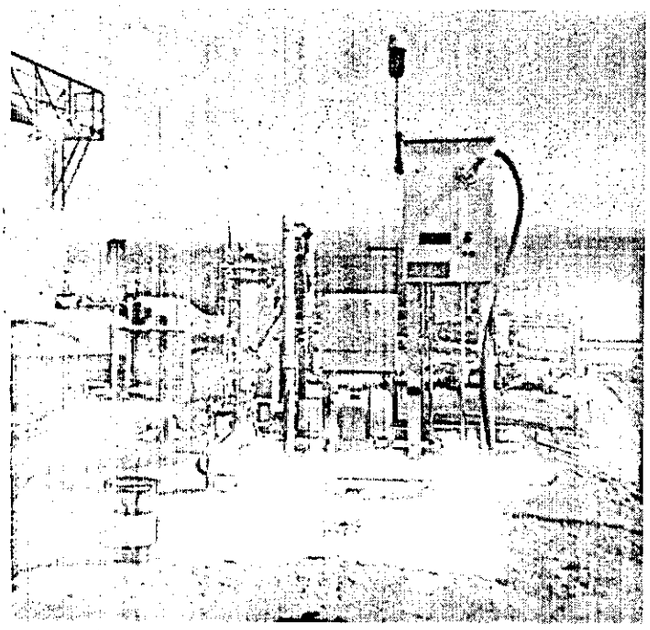
Since inception of waterflood operations, lease oil production has been fairly constant. This represents a substantial oil increase since the primary decline was approximately 30% per year. At the present time, 68% of the total lease production is due to water injection.

The area under waterflood operations was originally developed on 40-acre spacing and the injection pattern chosen was a five-spot. Calculated voidage totaled 500,000 bbl per well or 1,000,000 bbl per 80-acre five-spot. These high voidage figures were due to the reservoir conditions, i.e., high initial gas in solution and the bubble point being original reservoir pressure. For instance, of the 500,000 bbl voidage per well, only 70,000 bbl were stock tank oil.

When calculated fill-ups were reached and the producing wells were not responding as anticipated, it was determined that the water injection efficiency was only 25% due to the north-east south-west fractures system of the field. Water has been traced three to four miles from injection wells. To overcome this situation, it was decided during May 1963, to increase pressure from 2000 to 2500 psi on seven of the injection wells. With this increase in pressure, lease oil production increased approximately 25%. This was encouragement enough to justify increasing pumping plant facilities.

## New Pumping Facilities

To handle the high volumes and pressures anticipated, horizontal, split-case 10-stage 3 x 8½ centrifugal pumps were chosen. These pumps will handle 22,000 bpd each at a differential pressure of 3500 psi, with a maximum working pressure of 4500 psi. They are constructed of 316 stainless steel throughout and are designed to operate at a speed of 6100 rpm. These are the first two pumps of this new design made. Prime mover for each pump is a new design 1850-hp, 10 x 10½-in., turbocharged V-16 cylinder gas engine rated at 850 rpm. The pump and prime mover are connected by a speed increasing gear with ratio of 1:7.17, or 850 rpm input speed to 6100 rpm output speed. The gear is designed for 2000 hp with a service factor of 1.75, and

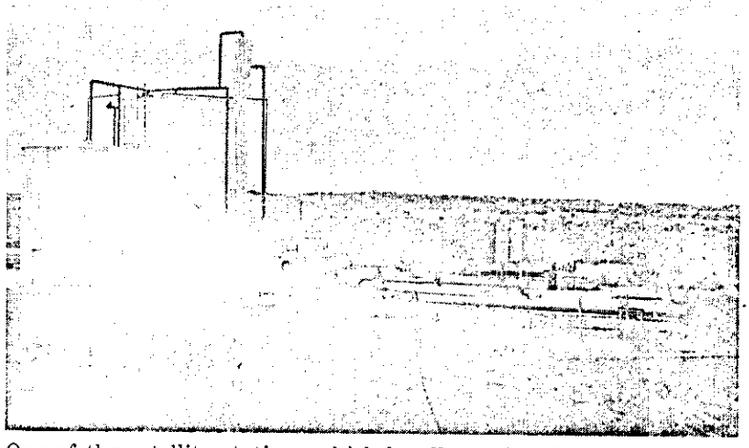


Central station is equipped with this lease automatic custody transfer unit which controls the flow of fluids from each satellite station, makes appropriate readings and records.

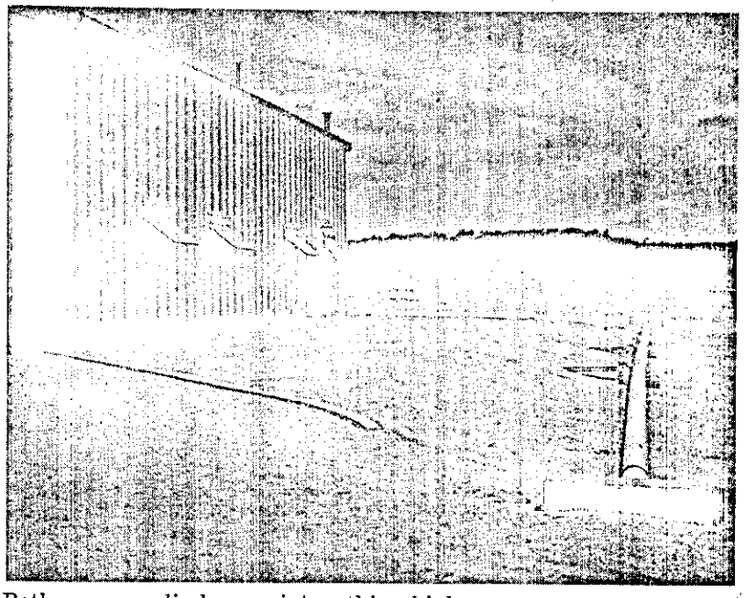
was especially engineered for this project. This plant was built by White Superior under a turnkey contract and is capable of pumping 50,000 bpd at 3000 psi or 44,000 bpd at 3500 psi. It was designed also to operate eventually at 4500 psi if necessary. To achieve 4500 psi pressure, it will be necessary to install 1000 psi booster pumps to the suction of the present pumps. At the present time this plant is handling 42,000 bpd at 3125 psi which is all the water supply available at the present time. The original plant is being used as a produced water plant, which is re-injecting produced water in the producing formation in a separate system.

## Pump Station Controls

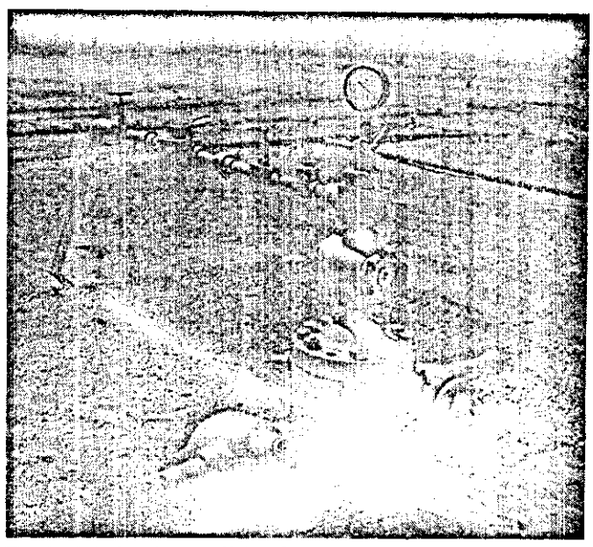
The pump station is attended only seven hours daily, so it was necessary to install controls to protect the equipment during the unattended time. The two different supply waters entering a 10,000-bbl epoxy-lined tank are controlled by two different systems. The fresh water supply coming from Sun Oil Co.'s treating plant is controlled by a snap-acting level control switch. When water in the tank reaches a certain level, a mercury switch closes and sends a signal to an electrical-pneumatic operated valve on the discharge of the centrifugal pump at Sun's plant some 5½ miles away. This is a three-way, two-position, butterfly valve which diverts the flow and allows the pump to circulate back to their tank. When the



One of the satellite stations which handle produced fluids artificially lifted by hydraulic pumping.



Both pumps discharge into this high-pressure header made of 8⅝-in. N-80 casing and cement lined for corrosion protection.



Typical injection well hookup to handle water from the new pump station at pressures over 3000 psi.

level drops in the tank, the circuit is interrupted to allow the valve to return to its original position and deliver water again.

This type of control was used for two reasons. First, the 18-in. water supply line was designed for very little back pressure. Second, the centrifugal pump at Sun's plant is operated by a two-cycle gas engine which would have to be started manually if shut down.

The alluvial system is controlled by a pneumatically controlled butterfly valve which operates as a throttling valve as the level in the tank changes. At a pre-determined pressure, the vertical turbine pump which supplies the alluvial water, is shut down so that it would not be pumping against a closed valve.

Emergency shut down switches for the new centrifugal pumps, gear and driving engine are enclosed in a panel and operated by the pulse generator on each engine. They do not require an outside power source. Each switch has a tattletale to indicate cause of a shutdown. These switches determine bearing temperatures, cooling water temperature, cooling water pressure, oil pressure and temperature, pump suction and discharge pressures. The engine control panels include a scanning device which indicates individual cylinder temperatures and exhaust temperatures. If temperatures become too high, the affected engine is shut down.

## Engine Overload Control

Of concern from the beginning was a way to prevent the pump from overloading the engine. A decrease in pump pressure when operating at maximum horsepower would cause the engine to overload. It was decided to install a pneumatic panel to control engine speeds. This panel consists primarily of an orifice plate on the suction side of the pump which indicates volumes. A pressure instrument on the pump discharge indicates discharge pressures.

These differentials and pressures are converted to a 3-15 psi signal and transmitted to the panel. By pneumatic computing, this signal is converted to a second pneumatic signal sent to the engine governor to control engine speed. The desired volume may be set on a dial on the panel and the engine will maintain this volume. If conditions are such that the engine is overloaded, as calculated from the pump curve, the panel will slow the engine down until the maximum horsepower curve is reached.

Also included in the panel is a low flow shut down switch. If flow falls below 250 gpm, this

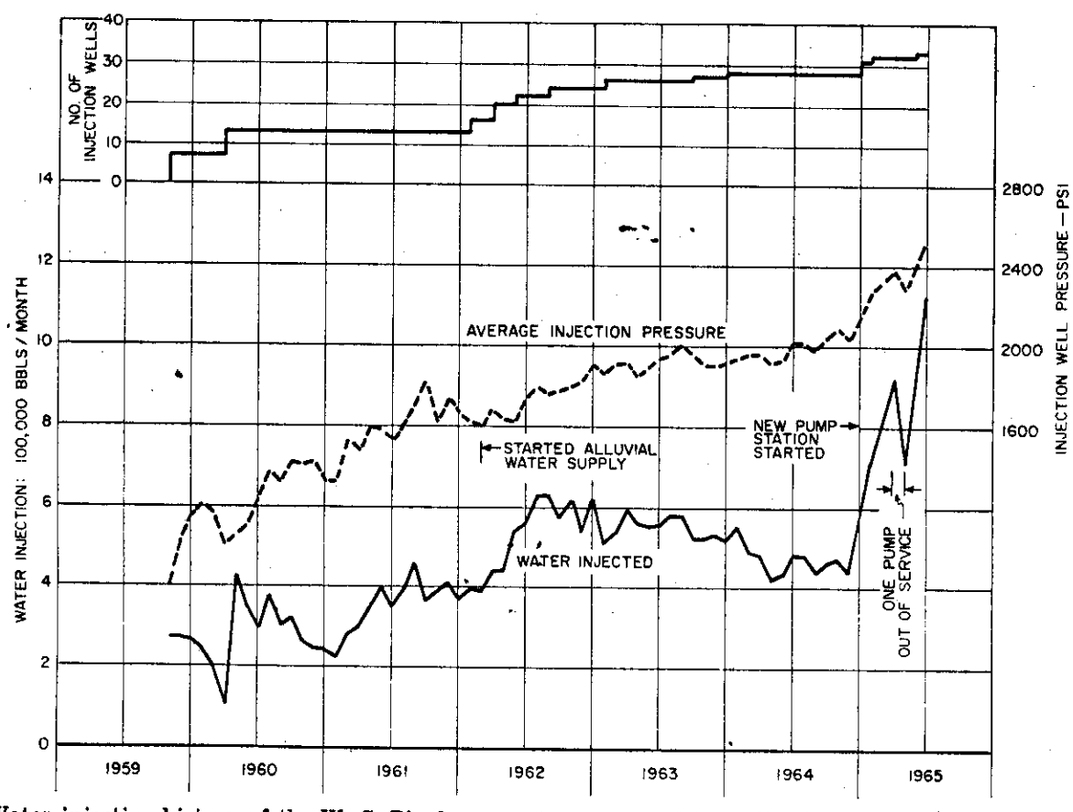



**Fig. 5. Water injection history of the W. C. Blanks lease. Note steady decline of injection rates with former pump station. Rapid increase of injection rates are noted immediately after start-up of new pumping facilities. Drop in April was due to taking one pump out of service.**

switch will shut the engine down to prevent damage to the pump because of the heat generated in the pump at low volumes.

In conjunction with the above shut down switches is an alarm system. In case of engine shutdown for any reason, a circuit is energized to set off a rotating beacon located on top of the 10,000-bbl tank. This beacon may be seen from almost any place in the field. When the plant is unattended, this alarm will ring three different phones in the field camp in rotation. If these phones are not answered, it will dial and ring a phone in Colorado City, Tex. If an answer is still not obtained, the sequence will be repeated until a phone is answered. When the phone is answered there is an audio tone which indicates trouble at the plant.

## Water Distribution System

To contain the high injection pressures anticipated, it was necessary to install casing and tubing as injection lines. The main line out of the plant is 8⅝-in., 36-lb, N-80 casing. Main laterals off of this line are 7-in., 29-lb and 32-lb, N-80 and P-110 casing, 5-in., 19.50-lb, Grade E drill pipe, 2⅞-in., 6.50-lb, N-80 tubing and 2⅜-in., 4.7-lb, J-55 tubing. All injection lines were cement lined and welded. High pressure water is metered at individual injection wells through 1-in., turbine-type meters. The 2⅜-in. tubing in each injection well is plastic-coated and set on a production packer with a latch-down mandrel also plastic coated.

## Measuring Results

The final objective is to increase oil production from the W. C. Blanks lease. Earlier water injection operations did halt a drastic production decline, but limited volumes and limited injection pressures (2500 psi) appeared to be losing ground in this rate-sensitive reservoir with a high voidage factor. It appeared to be a matter of injecting water at a high enough rate to fill the voids and improve oil recovery rates. This meant injecting greater volumes of water . . . which also meant higher injection pressures.

The new pump station has made the later objective successful. After the usual operational problems were corrected, the pump station began design capacity operations of 1,260,000 bbl per month in June 1965. It is much too early at this writing to evaluate the new high-pressure, high-volume injection operation as a commercial success. It may take months before the effects are felt through this extremely tight formation and show up as sustained oil production increases. The first engineering objective has been achieved by the higher rates. With this difficult hurdle completed, an optimistic outlook is maintained and it is anticipated that recovery will be doubled.

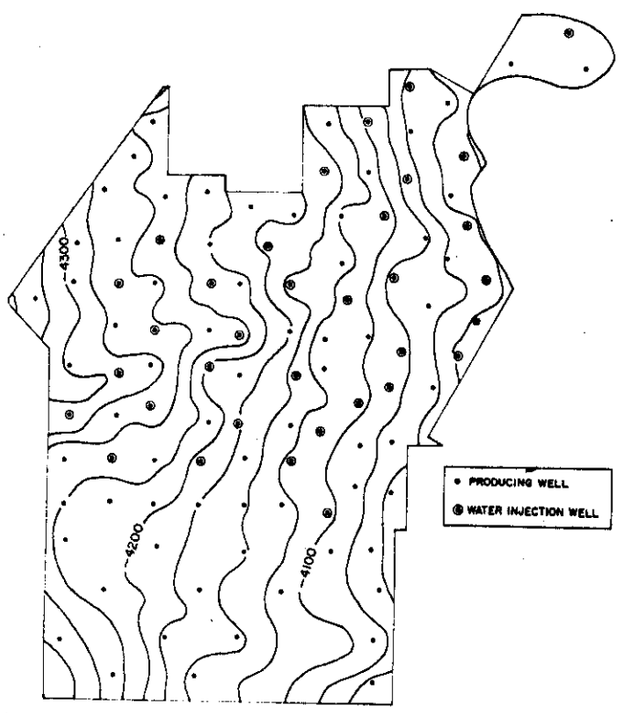



Fig. 6. Injection pattern in relation to producing wells shown on contour map of the pay sand within the boundary of the W. C. Blanks lease. Depths are sub-sea.

## About the Authors

Tom Covington

Fred Wilcox

Tom Covington is general superintendent for Perkins-Prothro Co. of Wichita Falls, Tex. He was graduated from The University of Oklahoma in Jan. 1949 and worked for Tidewater Oil Co. in Venice, La. and later transferred to Victoria, Tex. as a district engineer. He joined Perkins-Prothro in 1954 at Silver, Tex., and was made general superintendent in 1958.

Fred Wilcox is an engineer for Perkins-Prothro Co. at its Wichita Falls, Tex. headquarters. Following graduation from The University of Tulsa in Jan. 1950, he became a roughneck on a Parker Drilling Co. rig, and later that same year joined Deep Rock Oil Co. as an engineer in Tulsa, Okla. He was transferred to Kansas in 1952 as a waterflood engineer. In March 1955, he was employed by Perkins-Prothro Co. to work in the Jameson Strawn field of Coke County, Tex., and was moved to the Wichita Falls office in 1961. ■

# EBOR PILOT FLOOD

Secs. 35 & 36-9-29

CONSENTS:

1. Working Interest Owners - Complete
2. Royalty Interest Owners - Incomplete
   - dependent on the holdings of Canada Permanent Trust in the SE/4 of 35, and SE of 36.
   - percentage of Royalty interests not detailed.

INTRODUCTION - Page 2

The last sentence of the last paragraph leaves little alternative but to attempt a pilot waterflood.

HISTORY - page 3 Pressure Survey

The original discovery well, 2-36, went on production in February 1964. As of June 1, 1965, this well indicated a pressure drop of some 900 psi., with the withdrawal of approximately 6,800 barrels of fluid (oil & water). The pressure decline appears to be following a similar pattern on the other wells except for 7-35 and 13-36. These 2 wells (7-35 & 13-36) indicate little pressure decline as of June 1965, and fluid withdrawals were about the same for each of these two wells, at that time.

A copy of the subsurface pressure survey run on 7-35-9-29 mentions that the bomb was recovered after 38 hours.

The results of the interference test may indicate permeability barriers, though the fluid withdrawal by the producing wells may not have been great enough to show any pressure drawdown over a short period of time.

COMPLETION PRACTICE - page 4 — TABLE III - O.K.

WATERFLOOD RECOVERY

No study of Ebor Core.

Overall waterflood efficiency is calculated at 21%.

Primary recovery estimated at 2%.

Oil recoverable by waterflooding 21 - 2 = 19%.

PROPOSED WATERFLOOD

Injection rate = 500 - 1000 bbls/day.

Field withdrawal rate (Total Fluid) = 200 bbls/day (March/66)

Field total voidage at March/66 - approx. 125,000 bbls.

180 days flood at 750 bbls/day = 135,000 bbls injected.

180 days would appear to be a minimum time interval, if injection rate averaged 750 bbl/day, in order to equalize voidage in the field. However, the effect should be indicated in the offsetting wells on 7-35, 5-36 and 13-36, in much less time if there is going to be any response to waterflooding.

Pipe line Construction
Exemption Under Sec 23

EBOR PILOT FLOOD. Sec 35 & 36 - 9-29

CONSENTS:

1. Working Interest Owners - Complete.

FIG. XVIII 2. Royalty " " - INCOMPLETE
- dependent on the holdings of Canada Permanent Trust on the SE¼ of 35, and SE of 36.

percentage of Royalty interests not detailed.

INTRODUCTION. - page 2.
~~The last paragraph sums up the reasons for the pilot flood.~~
The last sentence of the last paragraph leaves little alternative but to attempt a pilot-water flood.

History. - page 3. pressure survey.

The original discovery well, 2-36, went on production in February 1964. As of June 1, 1965 this well indicated a pressure drop of some 900 psi, with the withdrawal of approx. 6800 barrels of fluid (oil+water). The pressure decline appears to be following a similar pattern on the other wells except for 7-35 and 13-36. These 2 wells (7-35 & 13-36) indicate little pressure decline as of June 1965 and fluid withdrawals were about the same for each of the two wells, at that time.

A copy of the Subsurface Pressure Survey run on 7-35-9-29 mentions that the bomb was recovered after 38 hours. ~~was [illegible]~~

The ~~[illegible]~~ results of the interference test may indicate permeability barriers, though the fluid withdrawal by the producing wells may not have been great enough to show any pressure drawdown over a short period of time.

Completion Practice. page 4.

Table III indicates quite a range of sub-sea elevations for the perforated zones. Do they intend to inject through the perfs, as listed in Table III for the well on 9-35? The perfs as shown in Figure XIV do not correspond exactly with those listed in Table III for 9-35.

Waterflood Recovery

No study of EBOR CORE

Overall waterflood efficiency is calculated at 21%

Primary Recovery estimated at 2%

Oil Recoverable by waterflooding 21-2 = 19%

Proposed water flood.

Injection Rate = 500-1000 bbls/day.

Field withdrawal rate (TOTAL FLUID) = 200 bbls/day. (MARCH/66)
" Total Voidage at March 66 approx 125,000 bbls.

150 days flood at 750 bbls/day = 135,000 bbls injected

150 days would appear to be a minimum time interval, if injection rate averaged 750 bbl/days in order to equalize voidage in the field. However the effect should be indicated in the offsetting wells on 7-35, 5-36, and 13-36 in much less time, if there is going to be any response to water flooding.

**BRALORNE PETROLEUMS LIMITED**
P.O. BOX No. 1240
VIRDEN, MANITOBA

March 15, 1967

DEPARTMENT OF MINES & NATURAL RESOURCES
MAR 16 1967
PETROLEUM ENGINEERING DIVISION

Department of Mines and Natural Resources,
Norquay Building,
Winnipeg, Manitoba.

Attention: M. J. Gobert

Dear Sir:

Re: Ebor Pilot Flood.

Enclosed herewith is copy of Water License No. 67-8 issued by Water Control and Conservation Branch, Department of Agriculture and Conservation.

Yours very truly,

BRALORNE PETROLEUMS LTD.

Per:

H. B. Elder, P. Engineer.

HBE/dml

DEPARTMENT OF MINES
AND NATURAL RESOURCES
MAR 16 1967
ASSISTANT DEPUTY MINISTER'S
OFFICE

PROVINCE OF MANITOBA

DEPARTMENT OF AGRICULTURE AND CONSERVATION
**WATER CONTROL AND CONSERVATION BRANCH**
NORQUAY BUILDING,
WINNIPEG 1

OFFICE OF DIRECTOR
Acting

File: 90.1.6 (Bralorne)

March 9, 1967.

Bralorne Petroleums Limited,
P.O. Box 1240,
Virden, Manitoba.

Attention: Mr. H.B. Elder, P. Eng.

Dear Sir:

Herewith you will find your copy of License No. 67-8 issued under the Water Rights Act.

Yours very truly,

T. E. WEBER, P. Eng.,
Acting Director,
Water Control & Conservation Branch.

GS/sj
Encl.

PROVINCE OF MANITOBA

DEPARTMENT OF AGRICULTURE AND CONSERVATION
**WATER CONTROL AND CONSERVATION BRANCH**

# LICENSE TO USE WATER FOR PETROLEUM RECOVERY PURPOSES

Issued in accordance with the provisions of
"THE WATER RIGHTS ACT"
and regulations made thereunder.

License No. 67-8

Know all men by these presents that in consideration of and subject to the provisoes, conditions and restrictions hereinafter contained, the Minister of ~~Agriculture and Conservation~~ HIGHWAYS for the Province of Manitoba does by these presents give full right and liberty, leave and license to BRALORNE PETROLEUMS LTD.

of the in the Province of Manitoba, hereinafter called "the LICENSEE", to divert water from Pipestone Creek ~~for purposes by means of a pumping installation (hereinafter called "the WORKS"), the water to be used, and the WORKS to be placed, on~~ for the purpose of injecting water into an oil well for petroleum recovery purposes, by means of a pumping installation and pipeline (hereinafter called "the WORKS") to be situated on the North-east quarter of Section 26, the East Half of Section 35 and the road allowance north of the said North-east quarter of Section 26, all in Township 9 and Range 29 West of the Principal Meridian in Manitoba, and as more particularly shown in red on a plan filed in the office of the Director of Water Control and Conservation, a copy of which plan is hereto attached and marked Exhibit "A".

This License is issued subject to the provisions of all regulations governing the licensing for and the use of water in Manitoba and, without limiting the generality of the aforesaid, to the following terms and conditions, namely:

1. The water shall be used solely for petroleum recovery purposes.

2. The WORKS shall be operated in accordance with the terms herein contained.

3. The rate at which water shall be diverted pursuant hereto shall not exceed 0.07 cubic feet of water per second and the total quantity diverted in any one year shall not exceed 25 acre feet.

~~4. No water shall be diverted during any period when the flow in is less than cubic feet per second as measured at~~

5. The LICENSEE does hereby remise, release and forever discharge Her Majesty the Queen in Right of the Province of Manitoba, of and from all manner of action, causes of action, claims and demands whatsoever which against Her Majesty the LICENSEE ever had, now has or may hereafter have, ~~for or by reason of the flooding of~~ resulting from the use of water for petroleum recovery purposes.

~~and any injury occasioned thereby or which may thereby be occasioned to the aforesaid lands.~~

6. In the event that the rights of others are infringed upon and/or damage to the property of others is sustained as a result of the operation or maintenance of the WORKS and the rights herein granted, the LICENSEE shall be solely responsible and shall save harmless and fully indemnify Her Majesty the Queen in Right of the Province of Manitoba, from and against any liability to which Her Majesty may become liable by virtue of the issue of this License and anything done pursuant hereto.

7. This License is not assignable or transferable by the LICENSEE and when no longer required by the LICENSEE this License shall be returned to the said Minister for cancellation.

8. Upon the execution of this License the LICENSEE hereby grants the said Minister and/or his Agents the right of ingress and egress to and from the said lands for the purpose of inspection of the WORKS and the LICENSEE shall at all times comply with such directions and/or orders that may be given by the said Minister or his Agents in writing from time to time with regard to the operation and maintenance of the WORKS and appurtenances.

9. If for any reason whatsoever the said Minister deems it advisable to cancel this License, he may do so by letter addressed to the LICENSEE at Box 1240, Virden, Manitoba and thereafter this License shall be determined and at an end.

~~10. Notwithstanding anything preceding in this License the water shall be used, and the WORKS shall be placed, only on land owned by the LICENSEE.~~

~~11. The term of this License shall be _____ years and this License shall become effective only on the date of execution hereof by the Director of Water Control and Conservation.~~

12. This License shall become effective only on the date of execution hereof by the Director of Water Control and Conservation and shall terminate as of December 31, 1967.

In witness whereof I the undersigned hereby agree to accept the aforesaid License on the terms and conditions set forth therein and hereby set my hand and seal this 3 day of March, A.D. 19 67

SIGNED, SEALED AND DELIVERED
in the presence of

Witness

BRALORNE PETROLEUMS LTD.

Per: [illegible] (President)

Per: D M Langlois Asst Sec (Seal)

Licensee

Canada
PROVINCE OF MANITOBA
To Wit:

I, _____ of the _____ of _____ in the Province of Manitoba

Occupation

MAKE OATH AND SAY:

1. That I was personally present and did see _____, the within named party, execute the within Instrument.

2. That I know the said _____ and am satisfied that he is of the full age of twenty-one years.

3. That the said Instrument was executed at _____ aforesaid and that I am subscribing witness thereto.

SWORN BEFORE me at the _____

of _____

in the Province of Manitoba

this _____ day of _____ A.D. 19

Witness

A COMMISSIONER FOR OATHS
in and for the Province of Manitoba
My commission expires

Issued at the City of Winnipeg, in the Province of Manitoba, this 6 day of March A.D. 1967

The Honourable the Minister of Highways
by the Acting Director of
Water Control and Conservation as authorized by
Order-in-Council No. 1146/66

~~The Honourable the Minister of Agriculture and Conservation by the Director of Water Control and Conservation as authorized by Order-in-Council No. _____~~

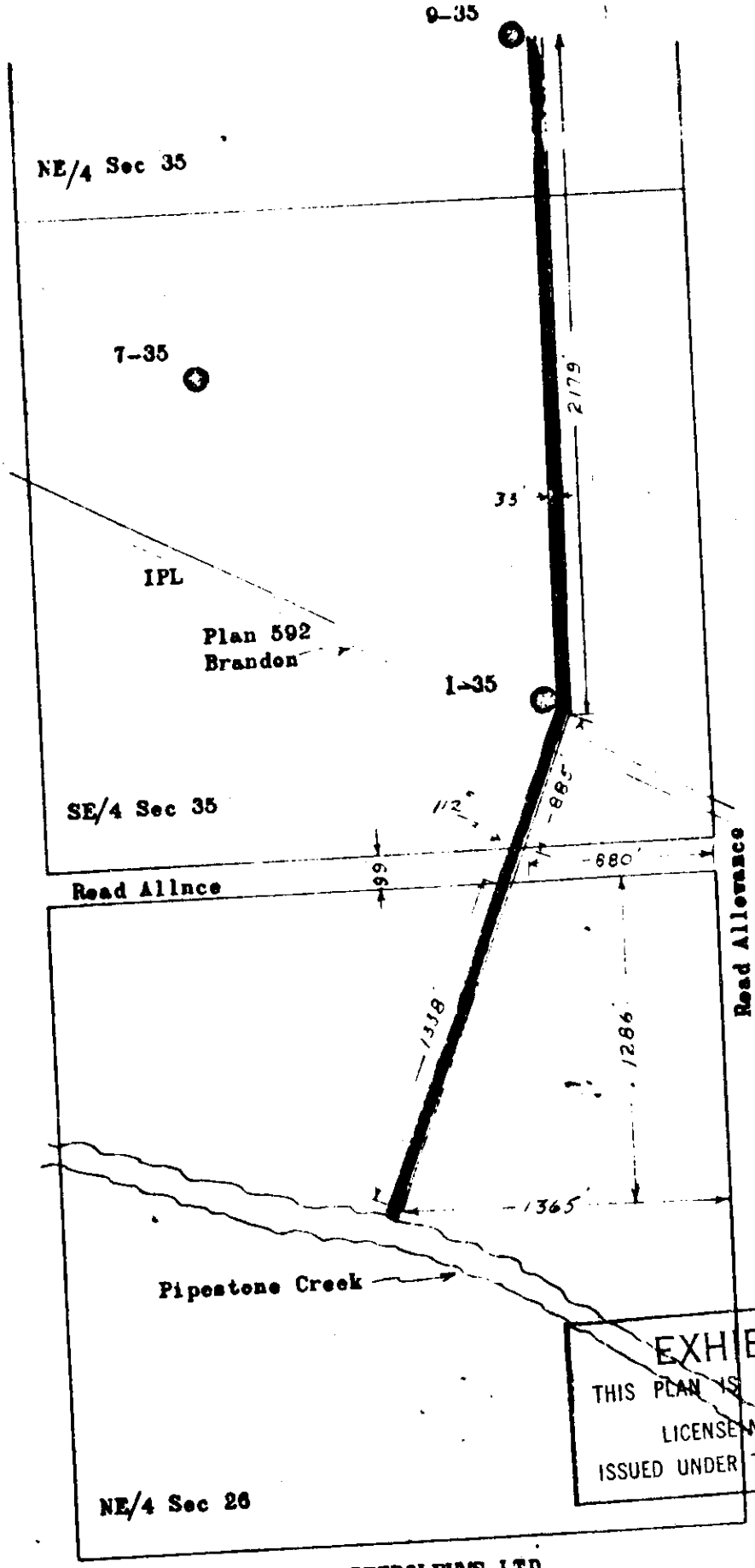



EXHIBIT "A"
THIS PLAN IS AN INTEGRAL PART OF
LICENSE NO. 67-8
ISSUED UNDER THE WATER RIGHTS ACT.

BRALORNE PETROLEUMS LTD

Detailed Sketch of Temporary Surface Laid Fresh Water Pipeline Right-of-Way, Pipestone Creek to LSD 9-35-9-29.

**BRALORNE PETROLEUMS LIMITED**
P.O. BOX NO. 1240
VIRDEN, MANITOBA

March 6, 1967

Department of Mines and Natural Resources,
Norquay Building,
Winnipeg, Manitoba.

Attention: Mr. M. J. Gobert.

Dear Sir:

Re: Ebor Pilot Flood.

The enclosed copy of a letter from the Water Control and Conservation Branch is for your information. A copy of the executed license will be forwarded to your office at a later date.

Yours very truly,

BRALORNE PETROLEUMS LTD.

Per: H. B. Elder, P. Engineer.

HBE/dml

Encl.

ASSISTANT DEPUTY MINISTER'S OFFICE

PROVINCE OF MANITOBA

DEPARTMENT OF AGRICULTURE AND CONSERVATION
**WATER CONTROL AND CONSERVATION BRANCH**
NORQUAY BUILDING
WINNIPEG 1

OFFICE OF DIRECTOR
Acting

File: 90.1.6 (Bralorne)

February 28, 1967.

Bralorne Petroleums Limited,
P.O. Box 1240,
Virden, Manitoba.

Attention: Mr. H. B. Elder, P. Eng.

Dear Sir:

Herewith you will find License No. 67-8 in duplicate issued under the Water Rights Act. I would request that you review the terms and conditions of this License, and if acceptable to you, have the signing officers of your corporation complete the acceptance clause thereof and place thereon the corporate seal.

Please return both copies of the License to this office for execution by myself following which one copy will be returned to you for your file.

Yours very truly,

T. E. WEBER, P. Eng.,
Acting Director,
Water Control & Conservation Branch.

GS/sj
Encl.

PS-C-53

# COPY

January 31, 1967.

Mr. H. B. Elder, P. Engineer,
Bralorne Petroleums Ltd.,
Box No. 1240,
Virden,
Manitoba.

Dear Mr. Elder:

This will acknowledge the "Report on: Pilot Water Flood, Section 35 and Section 36, Township 9, Range 29, W.P.M., Ebor Area", accompanying your letter of January 23rd, addressed to Mr. Gobert.

Would you kindly let us know if you intend to make a formal application to The Oil and Natural Gas Conservation Board for an extension of Order No. PM 6, as indicated in the "Recommendation" contained in this Report.

Yours very truly,

J. S. Richards,
Director of Mines.

JSR:db

c. c. to: Mr. M. J. Gobert,
Assistant Deputy Minister.

Mr. F. S. Gamey,
Reservoir Engineer — with above Report.

DEPARTMENT OF MINES & NATURAL RESOURCES
JAN 31 1967
PETROLEUM DIVISION

BRALORNE PETROLEUMS LIMITED
P.O. BOX NO. 1240
VIRDEN, MANITOBA

January 23, 1967

Department of Mines and Natural Resources,
Deputy Minister's Office,
Legislative Building,
Winnipeg 1, Manitoba.

Attention: M. J. Gobert, Assistant Deputy Minister.

Dear Sir:

Enclosed herewith is a report of the results obtained from the Pilot Water Flood in the Ebor Area conducted by Bralorne Petroleums Ltd. during the period July 1st to October 31st, 1966.

We would appreciate receiving your comments.

Yours very truly,

BRALORNE PETROLEUMS LTD.

Per:

H. B. Elder, P. Engineer.

/dml

Encl. 1

Orig. returned to: Mr. M. J. Gobert,
Assistant Deputy
Minister

p. c. to: Mr. F. S. Gamey,
Reservoir Engineer.

DEPARTMENT OF MINES
AND NATURAL RESOURCES
JAN 25 1967
ASSISTANT

DEPARTMENT OF MINES AND NATURAL RESOURCES
ROUTE SLIP

| TO | FROM |
|---|---|
| Mr. F.S.Gamey | Mr.M.J.Gobert |
| TO | FROM |

- ☐ For your approval or revision
- ☐ For your information
- ☐ Please take action
- ☐ Extracts of minutes for your information and action
- ☐ Please draft reply for signature of
- ☐ Reply direct with copy to me
- ☐ Please supply data for my reply
- ☐ Return with comments and/or recommendations
- ☐ Investigate and report
- ☐ Please sign
- ☐ Please return
- ☐ Please see me
- ☐ Please phone

Date Sept.27,1966. Subject

Message

Dec 31, 1966

MNR-A-94 Use reverse side if necessary

**BRALORNE PETROLEUMS LIMITED**

P.O. BOX 1240
VIRDEN, MANITOBA
CANADA

J. E. Kamy

September 26, 1966.

Department of Mines and Natural Resources,
Mines Branch,
9th Floor, Norquay Building,
401 York Avenue,
Winnipeg 1, Manitoba.

Attention: M. J. Gobert, Assistant Deputy Minister

Dear Sir:

Enclosed is copy of license No. 66-17 issued by The Water Control and Conservation Branch and pertaining to the Ebor Pilot Waterflood.

Yours very truly,

BRALORNE PETROLEUMS LTD.

Per: H. B. Elder

HBE/dmb

H. B. Elder, P. Engineer.

DEPARTMENT OF MINES
& NATURAL RESOURCES
SEP 27 1966
PETROLEUM ENGINEERING
DIVISION

DEPARTMENT OF MINES
AND NATURAL RESOURCES
SEP 27 1966

PROVINCE OF MANITOBA

DEPARTMENT OF AGRICULTURE AND CONSERVATION
**WATER CONTROL AND CONSERVATION BRANCH**

# LICENSE TO USE WATER FOR PETROLEUM RECOVERY PURPOSES

Issued in accordance with the provisions of
"THE WATER RIGHTS ACT"
and regulations made thereunder.

License No. 66-17

Know all men by these presents that in consideration of and subject to the provisoes, conditions and restrictions hereinafter contained, the Minister of Agriculture and Conservation for the Province of Manitoba does by these presents give full right and liberty, leave and license to BRAIORNE PETROLEUMS LTD.

of the in the Province of Manitoba, hereinafter called "the LICENSEE", to divert water from Pipestone Creek ~~for purposes by means of a pumping installation thereinafter called "the WORKS"), the water to be used, and the WORKS to be placed, on~~ for the purpose of injecting water into an oil well for petroleum recovery purposes, by means of a pumping installation and pipeline (hereinafter called "the WORKS") to be situated on the North-east quarter of Section 26, the East Half of Section 35 and the road allowance north of the said North-east quarter of Section 26, all in Township 9 and Range 29 West of the Principal Meridian in Manitoba, and as more particularly shown in red on a plan filed in the office of the Director of Water Control and Conservation, a copy of which plan is hereto attached and marked Exhibit "A".

This License is issued subject to the provisions of all regulations governing the licensing for and the use of water in Manitoba and, without limiting the generality of the aforesaid, to the following terms and conditions, namely:

1. The water shall be used solely for petroleum recovery purposes.

2. The WORKS shall be operated in accordance with the terms herein contained.

3. The rate at which water shall be diverted pursuant hereto shall not exceed 0.07 cubic feet of water per second and the total quantity diverted in any one year shall not exceed 25 acre feet.

~~4. No water shall be diverted during any period when the flow in is less than cubic feet per second as measured at~~

~~5. The LICENSEE does hereby remise, release and forever discharge Her Majesty the Queen in Right of the~~ Province of Manitoba, of and from all manner of action, causes of action, claims and demands whatsoever which against Her Majesty the LICENSEE ever had, now has or may hereafter have, for or by reason of the flooding of

~~and any injury occasioned thereby or which may thereby be occasioned to the aforesaid lands.~~

6. In the event that the rights of others are infringed upon and/or damage to the property of others is sustained as a result of the operation or maintenance of the WORKS and the rights herein granted, the LICENSEE shall be solely responsible and shall save harmless and fully indemnify Her Majesty the Queen in Right of the Province of Manitoba, from and against any liability to which Her Majesty may become liable by virtue of the issue of this License and anything done pursuant hereto.

7. This License is not assignable or transferable by the LICENSEE and when no longer required by the LICENSEE this License shall be returned to the said Minister for cancellation.

A-WT-4

Upon the execution of this License the LICENSEE hereby grants the said Minister and/or his Agents the right of ingress and egress to and from the said lands for the purpose of inspection of the WORKS and the LICENSEE shall at all times comply with such directions and/or orders that may be given by the said Minister or his Agents in writing from time to time with regard to the operation and maintenance of the WORKS and appurtenances.

9. If for any reason whatsoever the said Minister deems it advisable to cancel this License, he may do so by letter addressed to the LICENSEE at Box 1240, Virden, Manitoba, and thereafter this License shall be determined and at an end.

~~10. Notwithstanding anything preceding in this License the water shall be used, and the WORKS shall be placed, only on land owned by the LICENSEE.~~

~~11. The term of this License shall be years and this License shall become effective only on the date of execution hereof by the Director of Water Control and Conservation.~~

12. This License shall become effective only on the date of execution hereof by the Director of Water Control and Conservation and shall terminate as of December 31, 1966.

In witness whereof I the undersigned hereby agree to accept the aforesaid License on the terms and conditions set forth therein and hereby set my hand and seal this 26th day of July A.D. 1966

SIGNED, SEALED AND DELIVERED in the presence of

Witness

BRALORNE PETROLEUMS LTD.

Per: John Clarke (Pres)

Per: D M Braund (Asst Sec) (Seal)

Licensee

Canada
PROVINCE OF MANITOBA
To Wit:

I, of the of in the Province of Manitoba

Occupation

MAKE OATH AND SAY:

1. That I was personally present and did see , the within named party, execute the within Instrument.

2. That I know the said and am satisfied that he is of the full age of twenty-one years.

3. That the said Instrument was executed at aforesaid and that I am subscribing witness thereto.

SWORN BEFORE me at the

of

in the Province of Manitoba

this day of A.D. 19

Witness

A COMMISSIONER FOR OATHS
in and for the Province of Manitoba
My commission expires

Issued at the City of Winnipeg, in the Province of Manitoba, this 25th day of September A.D. 1966

The Honourable the Minister of ~~Agriculture~~ Highways ~~and Conservation~~ by the ~~Director of Water Control and Conservation as authorized by Order-in-Council No. 1179/59~~
Acting Director of Water Control and Conservation as authorized by Order-in-Council No. 1146/66.

August 3, 1966

DEPARTMENT OF MINES
& NATURAL RESOURCES
AUG 3 - 1966
DIRECTOR OF MINES

Bralorne Petroleums Limited,
P.O.Box 1240,
Virden, Manitoba.

Attention: Mr. H. B. Elder

Re: Bralorne Petroleums Limited
Ebor Field Pilot Water Flood

Dear Sir:

Your application, dated July 20, 1966, under subsection (2) of Section 2, Pressure Maintenance Rules, Order No PM 6, appears to be reasonable and is approved.

This approval is subject to the condition that the input water is to be filtered prior to injection.

Yours very truly,

M. J. Gobert,
Member.

MJG/h

cc: Stuart Anderson
J. S. Richards

August 3, 1966

Bralorne Petroleums Limited,
P.O.Box 1240,
Virden, Manitoba.

Attention: Mr. H. B. Elder

Re: Bralorne Petroleums Limited
Ebor Field Pilot Water Flood

Dear Sir:

Your application, dated July 20, 1966, under subsection (2) of Section 2, Pressure Maintenance Rules, Order No PM 6, appears to be reasonable and is approved.

This approval is subject to the condition that the input water is to be filtered prior to injection.

Yours very truly,

M. J. Gobert,
Member.

MJG/h

cc: Stuart Anderson
J. S. Richards

DEPARTMENT OF MINES AND NATURAL RESOURCES
ROUTE SLIP

| | |
|---|---|
| TO Foreman | FROM [illegible] |
| TO Mine Rescue | FROM |

- ☐ For your approval or revision
- ☐ For your information
- ☐ Please take action
- ☐ Extracts of minutes for your information and action
- ☐ Please draft reply for signature of
- ☐ Reply direct with copy to me
- ☐ Please supply data for my reply
- ☐ Return with comments and/or recommendations
- ☐ Investigate and report
- ☐ Please sign
- ☐ Please [illegible]
- ☐ Please see me
- ☐ Please phone

DEPARTMENT OF MINES & NATURAL RESOURCES
JUL 28 1966
DIRECTOR OF MINES

Date July 28/66 Subject

Message Please all out si this.
Bring copy of PM 6?

MNR-A-94 Use reverse side if necessary

**BRALORNE PETROLEUMS LIMITED**

P.O. BOX 1240
VIRDEN, MANITOBA
CANADA

July 20, 1966

THE OIL AND NATURAL GAS CONSERVATION BOARD
Department of Mines and Natural Resources
Room 310, Legislative Building
Winnipeg 1, Manitoba

ATTENTION: MR. STUART B. ANDERSON, CHAIRMAN

Dear Sir:

SUBJECT: BRALORNE PETROLEUMS LIMITED EBOR FIELD PILOT FLOOD

Permission is requested to comingle produced salt water from Ebor 9-35-9-29 battery with the fresh water presently being injected into the Ebor 9-35-9-29 well for the duration of the test period. The salt water production is presently averaging 70 barrels per day. Fresh water injected ranges from 800-900 barrels per day. It is intended that approximately 200 barrels of salt water be injected every third day with only fresh water injected the other days.

The two attached reports indicate that the two waters are compatible and that no formation damage would be executed.

Pipestone Creek is presently an adequate source of water. The above request is an economy move designed to reduce salt water disposal costs.

Yours very truly,

Harvey Elder

lea

DEPARTMENT OF MINES & NATURAL RESOURCES
JUL 28 1966
PETROLEUM ENGINEERING DIVISION

DEPARTMENT OF MINES & NATURAL RESOURCES
JUL 28 1966
Deputy Minister's Office

DEPARTMENT OF MINES AND NATURAL RESOURCES
JUL 28 1966

MANITOBA REGULATION 61/66

Being

THE OIL AND NATURAL GAS CONSERVATION BOARD

ORDER NO. PM 6

An Order pertaining to Pressure Maintenance by Water Flooding - Ebor Field.

Made and passed pursuant to "The Mines Act", by The Oil and Natural Gas Conservation Board.

(Filed June 14th, 1966)

---

WHEREAS, subsection (8) (d) of Section 59 of "The Mines Act", as enacted by Chapter 45, Statutes of Manitoba, 1955, provides as follows:

> "59. (8) Without restricting the generality of subsection (7) the board, with the approval of the minister, may make orders
>
> (d) requiring the repressuring, recycling, or pressure maintenance, of any pool or portion thereof where it is economical so to do, and for that purpose where necessary requiring the introduction or injection into any pool or portion thereof of gas, air, water, or other substance;".

AND WHEREAS, the Board, pursuant to Section 59 of "The Mines Act", held a public hearing on June 8, 1966, for the purpose of considering a Proposed Pilot Water Flood in a certain part of the Ebor Field in Manitoba, by Bralorne Petroleums Ltd.

AND WHEREAS, upon due consideration of the submissions and testimony at the hearing, the Board has found that it is reasonably necessary to conduct a pilot water flood in a certain part of the Ebor Field in Manitoba.

NOW, THEREFORE, the Board orders:

1. (a) Bralorne Petroleums Ltd. shall conduct a pilot water flood by the injection of water to the Lodgepole Formation of the Mississippian Age underlying the Ebor Field;

   (b) The pressure maintenance operations shall be in accordance with, and subject to, the following rules:

PRESSURE MAINTENANCE RULES

1. (1) Water shall be injected to the Lodgepole Formation of the Mississippian Age in the well:

Bralorne North Ebor 9-35-9-29

and, from time to time, in such other wells as the Board, after a further public hearing, may direct.

(2) The injection in the well referred to in this clause shall continue after commencement not more than one hundred and eighty (180) consecutive days from the date of this order.

2. (1) Before the injection of water is commenced, Bralorne Petroleums Ltd. shall satisfy the Board as to the source, suitability, and method of treatment of the water to be injected.

(2) Before any change is made in the source of the water being injected, Bralorne Petroleums Ltd. shall satisfy the Board as to the source, suitability, and method of treatment of the water to be injected.

3. Bralorne Petroleums Ltd. shall immediately report to the Board any indication of channelling or break-through of injected water to producing wells, or any indication of other detrimental effects that may be attributable to the pressure maintenance operations.

4. In the interest of equity and good engineering practice, the Board may prescribe from time to time a maximum pressure, or a minimum or a maximum rate, at which water shall be injected in the well referred to in clause 1 hereof.

5. Bralorne Petroleums Ltd. shall, not later than the twenty-fifth day of each month, file with the Mines Branch a report of the quantity and source of water injected during the preceding month to the well referred to in clause 1 hereof.

6. (1) Bralorne Petroleums Ltd. shall, within ninety (90) days of the completion of the pilot water flood, file with the Mines Branch a report of the performance and efficacy of the pressure maintenance program.

(2) Subject to any direction in writing of the Board to the contrary, a report required by this clause may, at the discretion of Bralorne Petroleums Ltd., be in two parts, the first of which parts shall set out graphically and from the commencement of the operation of the pressure maintenance program;

(a) the daily average rate during each month of oil production of each producing well,

(b) the average water-oil ratio during each month of each producing well,

(c) the monthly cumulative oil and water production from each producing well,

(d) the daily average rate during each month of water injection to the well referred to in clause 1 hereof,

(e) the daily average water injection pressure during each month to the said well,

(f) the monthly cumulative volume of water injected to the said well,

(g) the average injectivity index during each month for the said well, which index, at the discretion of Bralorne Petroleums Ltd., may be determined as

(i) the daily injection rate divided by the average injection well head pressure, or

(ii) any similar index that the Board, on the application of Bralorne Petroleums Ltd., may approve, and

(h) the date and type of any well treatment or workover which shall be indicated on the graph, and the second of which parts shall contain

(a) calculations of the balance during each month between water injected to, and fluids withdrawn from, the Lodgepole Formation underlying the Ebor Field,

(b) such other interpretative information as Bralorne Petroleums Ltd. considers necessary to evaluate adequately the performance and efficacy of the pressure maintenance program, and

(c) an outline of the method actually in use for the quality, control, and treatment of the water.

(3) If a report required by this clause is in the form provided for in subclause (2), the Board, at any time, may make the first part of the report available to the public, and, after one year from the end of the period for which the report is made, may make the second part of the report available to the public, and, if the report is not in the form provided for in subclause (2), the Board may make the whole of the report available to the public at any time.

2. This Order shall be effective at the hour of seven o'clock in the forenoon, Central Standard Time, on the fifteenth day of June, 1966.





Oil and Natural Gas Order No. PM 6, made and passed this 10th day of June, A. D., 1966, at the City of Winnipeg, in the Province of Manitoba, by The Oil and Natural Gas Conservation Board.

J. Stuart Anderson,
Chairman,
The Oil and Natural Gas Conservation Board

J. S. Richards,
Deputy Chairman,
The Oil and Natural Gas Conservation Board

M. J. Gobert,
Member,
The Oil and Natural Gas Conservation Board

APPROVED:

Sterling R. Lyon,
Minister of Mines and Natural Resources

Printed by R. S. Evans - Queen's Printer for the Province of Manitoba

# DOWELL OF CANADA

DIVISION OF DOW CHEMICAL OF CANADA, LIMITED

E Mar 27, 66

## CALGARY LABORATORY REPORT

DATE Feb. 16, 1966

C L No. 66-2018

S. No. --

TO E. Lowdon
Virden

TYPE OF SAMPLE Core

DESCRIPTION Core samples from Paradise Petroleums Ebor 7-35 and Ebor 1-35 at depths of 2568-80 and 2561 respectively.

---

The samples were sent in for solubility and swelling tests. The results follow:

| | Ebor 7-35 | Ebor 1-35 |
|---|---|---|
| Solubility in 15X | 82.5% | 78.0% |
| Swelling Tests: | | |
| Relative Volume in Kerosene | 1.0 | 1.0 |
| Relative Volume in Fresh Water | .97 | 1.0 |
| Relative Volume in Fresh Water 0.3M38 | .96 | 1.0 |
| Relative Volume in 10% NaCl | .97 | 1.0 |

No swelling problem would be expected.

Original signed by

F.J. Werth

---

cc: McCallum, Johnson, Ecker, Stewart, Cameron, File.

# DOWELL OF CANADA

DIVISION OF DOW CHEMICAL OF CANADA, LIMITED

## CALGARY LABORATORY REPORT

DATE June 16, 1966

TO E. Lowdon
Virden

C.L. No. 66-2132

S. No. 14951

TYPE OF SAMPLE Water

DESCRIPTION One sample of salt water from Brelorne Petroleums, Limited, Ebor 9-35 Battery and one sample of fresh water from Pipestone Creek in Section 35.

The samples were sent in to test their compatibility in view of the proposed use of the creek water for water flooding. The following observations were made:

> The samples were filtered and blends were prepared containing 0%, 10%, 25%, 50%, 75%, 90%, 100% fresh water. The blends were allowed to stand for 48 hours at room temperature. No cloudiness or precipitation occurred in any of the samples.

On the basis of this test, the waters appear to be compatible.

Both samples as received contain sediment, and in addition, the salt water contains a film of oil. The waters should be filtered or well settled before injecting into the well.

Original signed by

F.J. Werth

FJW/car

cc: McCallum, Johnson, Ecker, Stewart, Cameron, File

[illegible] July 6, 1966

July 26

Bert –

For your info.
Elbar pilot school.

Harvey

PROVINCE OF MANITOBA

OFFICE OF DIRECTOR

DEPARTMENT OF AGRICULTURE AND CONSERVATION
**WATER CONTROL AND CONSERVATION BRANCH**
NORQUAY BUILDING,
WINNIPEG 1

File: 90.1.6
(Bralorne)

July 5, 1966.

Bralorne Petroleums Ltd.,
P.O. Box 1240,
Virden, Manitoba.

Attention: Mr. H. B. Elder, P. Eng.

Dear Sirs:

Herewith you will find License No. 66-17 in duplicate issued under the Water Rights Act. I would request that you review the terms and conditions of this License and, if acceptable to you, have the signing officers of your corporation complete the acceptance clause thereof and place thereon the corporate seal.

Please return both copies of the License to this office for execution by myself following which one copy will be returned to you for your file.

Yours very truly,

J. A. Griffiths,
Director.

GS/sj
Encl.

July 26, 1966

Department of Agriculture and Conservation,
Water Control and Conservation Branch,
Norquay Building,
Winnipeg 1, Manitoba.

Attention: J. A. Griffiths, Director.

Dear Sir:

Re: Your File 90.1.6 (Bralorne)

We are returning herewith Licence #66-17 in duplicate which have been executed by the signing officers of Bralorne Petroleums Ltd. under the company seal.

Due to a vacation period, there has been considerable delay in returning these documents to your office for which we apologize.

Yours very truly,

BRALORNE PETROLEUMS LTD.

Per:

/dmb

H. B. Elder, P. Engineer.

Encls.

July 20, 1966

THE OIL AND NATURAL GAS CONSERVATION BOARD
Department of Mines and Natural Resources
Room 310, Legislative Building
Winnipeg 1, Manitoba

ATTENTION: MR. STUART B. ANDERSON, CHAIRMAN

Dear Sir:

SUBJECT: BRALORNE PETROLEUMS LIMITED EBOR FIELD PILOT FLOOD

Permission is requested to comingle produced salt water from Ebor 9-35-9-29 battery with the fresh water presently being injected into the Ebor 9-35-9-29 well for the duration of the test period. The salt water production is presently averaging 70 barrels per day. Fresh water injected ranges from 800-900 barrels per day. It is intended that approximately 200 barrels of salt water be injected every third day with only fresh water injected the other days

The two attached reports indicate that the two waters are compatible and that no formation damage would be ~~effected~~ expected.

Pipestone Creek is presently an adequate source of water. The above request is an economy move designed to reduce salt water disposal costs.

Yours very truly,

Harvey Elder

lss

STAN —
THIS IS A COPY

**BRALORNE PETROLEUMS LIMITED**

P.O. BOX 1240
VIRDEN, MANITOBA
CANADA

June 21, 1966.

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

Attention: M. J. Gobert, Assistant Deputy Minister.

Dear Sir:

Re: Ebor Field Pilot Water Flood.

In reply to your letter of June 17, 1966, this will confirm that Bralorne Petroleums Ltd. agrees to the following:

1. To file with the Oil and Natural Gas Conservation Board a copy of any licence issued to Bralorne by the Water Control and Conservation Branch of the Department of Agriculture and Conservation. This licence has not been received as of this date.

2. That a filter will be installed and used for treatment of source water. This filter is presently being installed.

3. That if the Pilot Water Flood, in our opinion, appears to be successful, Bralorne will initiate a plan of unitization of the area involved.

With reference to Item four, it was our understanding that a packer would be installed on the injection well tubing only if surface injection pressure approaches the working pressure limit of well head equipment.

Yours very truly,

BRALORNE PETROLEUMS LTD.

Per: H. B. Elder, P. Engineer.

HBE/dmb

A. D.
JUN 22 '66
ASSISTA.

DEPARTMENT OF MINES AND NATURAL RESOURCES
ROUTE SLIP

| TO | FROM |
|---|---|
| Mr. J. W. Richards | Mr. M. J. Gobert |
| TO | FROM |
| | |

- [ ] For your approval or revision
- [ ] For your information
- [x] Please take action
- [ ] Extracts of minutes for your information and action
- [ ] Please draft reply for signature of
- [ ] Reply direct with copy to me
- [ ] Please supply data for my reply
- [ ] Return with comments and/or recommendations
- [ ] Investigate and report
- [ ] Please sign
- [ ] Please return
- [ ] Please see me
- [ ] Please phone

DEPARTMENT OF MINES, NATURAL RESOURCES
JUN 27 1966
DIRECTOR OF MINES

Date June 27, 1966 Subject

Message Please reply direct with copy to me.

Water Conservation might advise re wells.

One Hemisphere helium well was converted to form use.

MNR-A-94 Use reverse side if necessary

Mr.J.S.Richards

June 17,1966

Bralorne Petroleums Limited,
P.O.Box 1240,
VIRDEN, Manitoba.

DEPARTMENT OF MINES
& NATURAL RESOURCES
JUN 17 1966
DIRECTOR OF MINES

Att: Mr. H.B.Elder.

**Re: Ebor Field Pilot Water Flood**

Dear Sir:

It is my understanding that at the June 8, 1966 Hearing you agreed:

1. To file with the Oil and Natural Gas Conservation Board a copy of any licence issued to your company by the Water Control and Conservation Branch of the Department of Agriculture and Conservation.

2. That a filter will be installed and used for treatment of the source water.

3. That if the pilot water flood appears to be successful, your company will initiate a plan for unitization of the area involved.

4. That a packer will be installed on the injection well tubing if the pilot water flood appears to be successful.

If you are in agreement with my interpretation of your statements at the Hearing, your acknowledgement would be appreciated.

Yours very truly,

M.J.Gobert
Assistant Deputy Minister

MJG/js
c.c. Mr.Stuart Anderson
Mr.J.S.Richards
Mr.F.S.Gamey

Mr.F.S.Gamey

DEPARTMENT
& NATURAL RESOURCES
JUN
PET

June 17,1966

Braiorne Petroleums Limited,
P.O.Box 1240,
VIRDEN, Manitoba.

Att: Mr. H.L.Alder.

**Re: Ebor Field Pilot Water Flood**

Dear Sir:

It is my understanding that at the June 8, 1966 Hearing you agreed:

1. To file with the Oil and Natural Gas Conservation Board a copy of any licence issued to your company by the Water Control and Conservation Branch of the Department of Agriculture and Conservation.

2. That a filter will be installed and used for treatment of the source water.

3. That if the pilot water flood appears to be successful, your company will initiate a plan for unitization of the area involved.

4. That a packer will be installed on the injection well tubing if the pilot water flood appears to be successful.

If you are in agreement with my interpretation of your statements at the Hearing, your acknowledgement would be appreciated.

Yours very truly,

M.J.Gobert
Assistant Deputy Minister

MJG/js

c.c. Mr.Stuart Anderson
Mr.J.S.Richards
Mr.F.S.Gamey

June 14,1966

Bralorne Petroleums Limited,
P.O.Box 1240,
Virden, Manitoba.

Attention: Mr. H.B. Elder

Re: Pipe Line Construction
Ebor Pilot Water Flood

Dear Sir:

With reference to your application dated May 12, 1966, enclosed herewith is Order of the Minister under Section 23 - The Pipe Line Act dated June 6, 1966, together with an approved copy of the sketch plan and a copy of a letter of approval as to road crossings, signed by Mr. L.W. Blackman on behalf of the Department of Highways.

Yours very truly,

M.J.Gobert
Assistant Deputy Minister

MJG/js
Encl.

DEPT. OF MINES & NATURAL RESOURCES
JUN 14 1966
PETROLEUM ENGINEERING DIVISION

PS-I-53

COPY

June 14, 1966.

J. S. Richards,
Director of Mines,
Mines Branch,
901 Norquay Building.

Mr. R. H. Tallin,
Registrar of Regulations,
Office of the Legislative Counsel,
237 Legislative Building.

The Oil and Natural Gas

Conservation Board -
Order No. PM 6.

Attached, hereto, for filing, original and two (2) copies of Certificate, and original and two (2) copies of Manitoba Regulation, being The Oil and Natural Gas Conservation Board Order No. PM 6, approved by the Minister of Mines and Natural Resources on June 10, 1966.

J. S. Richards.

:DB

Encs.

c. c. to: Mr. M. J. Gobert,
Assistant Deputy Minister.

Forwarded via Tube.

Mr. F. S. Gamey,
Reservoir Engineer.

DEPARTMENT OF MINES
& NATURAL RESOURCES
JUN 14 1966
PETROLEUM ENGINEERING
DIVISION

June 10, 1966

W. S. Richards
Deputy Chairman
Oil & Natural Gas Conservation Board

Stuart Anderson
Chairman
Oil & Natural Gas Conservation Board

Pressure Maintenance Order No. 6

Bralorne Petroleums Ltd.

Attached, hereto, Pressure Maintenance Order No. 6 prepared in accordance with the decision of Board following the Hearing held at Virden on June 8, 1966.

This Order in effect approves the application of Bralorne Petroleums Ltd., to conduct a Pilot Water Flood program in Sections 35 and 36, Township 9, Range 29, W.P.M., being a part of the Ebor Field.

The main provisions of the Order are:

1. That water may be injected into the North Ebor 9-35-9-29.
2. That the pilot water flood is limited to a maximum of 180 days.

As was emphasized at the Hearing, the purpose of the pilot water flood is to determine if waterflooding will improve production in this part of the Ebor. If successful, the Company plans to proceed with unitization of this area and a full-scale water flood program.

cc: M. J. Gobert

Mr. F. S. Gamey,
Reservoir Engineer.

DEPARTMENT OF MINES
& NATURAL RESOURCES
MAY 6 1966
PETROLEUM ENGINEERING
DIVISION

May 3, 1966.

DEPARTMENT OF MINES
& NATURAL RESOURCES
MAY 5 - 1966
DIRECTOR OF MINES

Mr. H. E. Elder,
Petroleum Engineer,
Bralorne Petroleums Limited,
P.O. Box 1240,
Virden, Manitoba.

Dear Sir:

I wish to acknowledge receipt of your letter of May 2, making application to conduct a pilot water flood in Section 35 and Section 36, Township 9, and Range 29, WPM, during the summer months of 1966.

I will be pleased to advise you further when the date for a Hearing is set.

Yours truly,

Stuart Anderson, SBA
Chairman,
Oil and Natural Gas
Conservation Board.

cc Mr. Gobert
Mr. Richards

p. c. Mr. F. S. Gamey,
Reservoir Engineer.

DEPARTMENT OF MINES
AND NATURAL RESOURCES
MAY - 4 1966
ASSISTANT DEPUTY MINISTER'S
OFFICE

BRALORNE PETROLEUMS LIMITED
P.O. BOX 1240
VIRDEN, MANITOBA
CANADA

May 2, 1966.

The Oil and Natural Gas Conservation Board,
Department of Mines and Natural Resources,
Room 310, Legislative Building,
Winnipeg 1, Manitoba.

Attention: Mr. Stuart B. Anderson, Chairman.

Dear Sir:

Bralorne Petroleums Ltd. hereby makes application to conduct a pilot water flood in Section 35 and Section 36, Township 9, and Range 29, WPM, during the summer months of 1966.

The enclosed application is presented in report form and includes drilling and production history, geology, estimated primary recovery, estimated waterflood recovery, and the proposed pilot waterflood. Numerous exhibits will be found following the discussion. The consent of all working interest and royalty interest owners was requested. Those replies which have been received are included in the application.

Permission has been requested of the Department of Agriculture and Conservation, Water Control and Conservation Branch, to use water from Pipestone Creek for the pilot flood. Their approval has not been received to date. This application is submitted in anticipation of such approval and to enable an early summer start of operations.

Mention will be made in several cases of Paradise Petroleums Ltd. Please be advised that the name has been changed to Bralorne Petroleums Ltd.

Yours very truly,

BRALORNE PETROLEUMS LTD.

Per: H. B. Elder

H. B. Elder, Petroleum Engineer.

HBE/dmb

DEPARTMENT OF MINES
& NATURAL RESOURCES
MAY 3 1966
Deputy Minister's Office

p. c. to: Mr. F. S. Gamey,
Reservoir Engineer.

May 3, 1966.

Mr. H. B. Elder,
Petroleum Engineer,
Bralorne Petroleums Limited,
P.O. Box 1240,
Virden, Manitoba.

Dear Sir:

I wish to acknowledge receipt of your letter of May 2, making application to conduct a pilot water flood in Section 35 and Section 36, Township 9, and Range 29, WPM, during the summer months of 1966.

I will be pleased to advise you further when the date for a Hearing is set.

Yours truly,

Stuart Anderson,
Chairman,
Oil and Natural Gas
Conservation Board.

cc Mr. Gobert
Mr. Richards

**BRALORNE PETROLEUMS LIMITED**

P.O. BOX 1240
VIRDEN, MANITOBA
CANADA

May 2, 1966.

The Oil and Natural Gas Conservation Board,
Department of Mines and Natural Resources,
Room 310, Legislative Building,
Winnipeg 1, Manitoba.

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Yours very truly,

BRALORNE PETROLEUMS LTD.

Per: H. B. Elder

H. B. Elder, Petroleum Engineer.

HBE/dmb

DEPARTMENT OF MINES
& NATURAL RESOURCES
MAY 3 1966
Deputy Minister's Office

May 3, 1966.

Mr. H. B. Elder,
Petroleum Engineer,
Bralorne Petroleums Limited,
P.O. Box 1240,
Virden, Manitoba.

Dear Sir:

I wish to acknowledge receipt of your letter of May 2, making application to conduct a pilot water flood in Section 35 and Section 36, Township 9, and Range 29, WPM, during the summer months of 1966.

I will be pleased to advise you further when the date for a Hearing is set.

Yours truly,

BBH

Stuart Anderson,
Chairman,
Oil and Natural Gas
Conservation Board.

cc Mr. Gobert
Mr. Richards
along with copies
of application

790.1

**BRALORNE PETROLEUMS LIMITED**

P.O. BOX 1240
VIRDEN, MANITOBA
CANADA

May 2, 1966.

The Oil and Natural Gas Conservation Board,
Department of Mines and Natural Resources,
Room 310, Legislative Building,
Winnipeg 1, Manitoba.

Attention: Mr. Stuart B. Anderson, Chairman.

Dear Sir:

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Yours very truly,

BRALORNE PETROLEUMS LTD.

Per: H. B. Elder

H. B. Elder, Petroleum Engineer.

HBE/dmb

DEPARTMENT OF MINES
& NATURAL RESOURCES
MAY 3 1966
Deputy Minister's Office

May 3, 1966.

DEPARTMENT OF MINES
& NATURAL RESOURCES
MAY 5 - 1966
DIRECTOR OF MINES

Mr. H. B. Elder,
Petroleum Engineer,
Bralorne Petroleums Limited,
P.O. Box 1240,
Virden, Manitoba.

Dear Sir:

I wish to acknowledge receipt of your letter of May 2, making application to conduct a pilot water flood in Section 35 and Section 36, Township 9, and Range 29, WPM, during the summer months of 1966.

I will be pleased to advise you further when the date for a Hearing is set.

Yours truly,

Stuart Anderson, B/B/H
Chairman,
Oil and Natural Gas
Conservation Board.

cc Mr. Gobert
Mr. Richards

p. c. to: Mr. F. S. Gamey,
Reservoir Engineer.

DEPARTMENT OF MINES
AND NATURAL RESOURCES
MAY - 4 1966
ASSISTANT DIRECTOR OF MINES
OFFICE

**BRALORNE PETROLEUMS LIMITED**

P.O. BOX 1240
VIRDEN, MANITOBA
CANADA

May 2, 1966.

The Oil and Natural Gas Conservation Board,
Department of Mines and Natural Resources,
Room 310, Legislative Building,
Winnipeg 1, Manitoba.

Attention: Mr. Stuart B. Anderson, Chairman.

Dear Sir:

Bralorne Petroleums Ltd. hereby makes application to conduct a pilot water flood in Section 35 and Section 36, Township 9, and Range 29, WPM, during the summer months of 1966.

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Yours very truly,

BRALORNE PETROLEUMS LTD.

Per: H. B. Elder

H. B. Elder, Petroleum Engineer.

HBE/dmb

DEPARTMENT OF MINES
& NATURAL RESOURCES
MAY 3 1966
Deputy Minister's Office

p. c. to: **Mr. F. S. Gamey,**
**Reservoir Engineer.**

April 5, 1966.

Mr. H. B. Elder, P. Engineer,
Paradise Petroleums Ltd.,
Box 1327,
Virden,
Manitoba.

Dear Mr. Elder:

This will acknowledge your letter requesting approval, on behalf of the Crown as royalty owner in respect to the N.W. 36 - 9 - 29, W., to a pilot water flood program in Sections 35 and 36 - 9 - 29, W.

The application for permission to carry out this pilot water flood project should be made to The Oil and Natural Gas Conservation Board. I feel that consent, as a royalty interest owner, should be deferred, at least, until an application has been made to the Conservation Board, at which time more would be known about your proposal.

Yours very truly,
ORIGINAL
SIGNED BY
STERLING R. LYON

Sterling R. Lyon,
Minister of Mines and
Natural Resources.

JSR:db

c. c. to: ~~Mr. Stuart Anderson,~~
~~Deputy Minister.~~
Mr. M. J. Gobert,
Assistant Deputy Minister.

Mr. F.S. Gamey,
Reservoir Engineer.

PS-1-53

March 22, 1966.

COPY

J. S. Richards,
Director of Mines.

Mr. Charles T. Birt,
Executive Assistant
to the Minister.

Paradise Petroleums Ltd.

DEPARTMENT OF MINES
& NATURAL RESOURCES
APR 5 - 1966
DIRECTOR OF MINES

Attached, hereto, draft reply to Mr. H. B. Elder's letter, requesting consent to a pilot water flood program in Sections 35 and 36 - 9 - 29, W., for the Minister's signature.

Original Signed
J. S. RICHARDS

J. S. Richards.

JSR:db

Encs.

c. c. to: Mr. M. J. Gobert,
Assistant Deputy Minister.

Mr. F. S. Gamey,
Reservoir Engineer.

DEPARTMENT OF MINES
& NATURAL RESOURCES
PETROLEUM ENGINEERING
DIVISION

PS-1-53

# COPY

April 5, 1966.

Mr. H. B. Elder, P. Engineer,
Paradise Petroleums Ltd.,
Box 1327,
Virden,
Manitoba.

Dear Mr. Elder:

This will acknowledge your letter requesting approval, on behalf of the Crown as royalty owner in respect to the N.W. 36 - 9 - 29, W., to a pilot water flood program in Sections 35 and 36 - 9 - 29, W.

The application for permission to carry out this pilot water flood project should be made to The Oil and Natural Gas Conservation Board. I feel that consent, as a royalty interest owner, should be deferred, at least, until an application has been made to the Conservation Board, at which time more would be known about your proposal.

Yours very truly,

"Original
Signed By
Sterling R. Lyon"

Sterling R. Lyon,
Minister of Mines and
Natural Resources.

JSR:db

c. c. to: ~~Mr. Stuart Anderson,~~
~~Deputy Minister.~~
Mr. M. J. Gobert,
Assistant Deputy Minister.

Mr. F.S. Gamey,
Reservoir Engineer.

DEPARTMENT OF MINES AND NATURAL RESOURCES
ROUTE SLIP

| | |
|---|---|
| TO Mr. J. S. Richards | FROM Charles T. Birt |
| TO | FROM |

- ☐ For your approval or revision
- ☐ For your information
- ☐ Please take action
- ☐ Extracts of minutes for your information and action
- ☐ Please draft reply for signature of
- ☐ Reply direct with copy to me
- ☐ Please supply data for my reply
- ☐ Return with comments and/or recommendations
- ☐ Investigate and report
- ☐ Please sign
- ☐ Please return
- ☐ Please see me
- ☐ Please phone

DEPARTMENT OF MINES AND NATURAL RESOURCES
MAR 11 1966
DIRECTOR OF MINES

Date March 11, 1966. Subject Paradise Petroleums Limited.

Message

Not usual to comment upon until has been forwarded and studied

May I have your comments on the

Paradise Petroleum Request.

Probably [illegible] as Regulations

— [illegible] O&N.G. Con. Board.

MNR-A-94 Use reverse side if necessary

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA
P.O. BOX XXXX #1240
VIRDEN, MANITOBA

WATER CONSERVATION
MAR 21 1966
WATER CONTROL AND
CONSERVATION BRANCH

March 16, 1966

Department of Agriculture and Conservation,
Water Control and Conservation Branch,
Room 105, Norquay Building,
Winnipeg, Manitoba.

Attention: W. A. Griffiths, Director.

Dear Sir:

Re: Application to divert water from
Pipestone Creek in NW¼ 26-9-29 WPM.

Paradise Petroleums Ltd. is presently preparing a submission to the Minister, Department of Mines and Natural Resources, requesting permission to conduct a pilot waterflood in sections 35 and 36, Twp. 9, Rge. 29, WPM. Elor area, Manitoba. The submission must explain the source of water that is to be used in the pilot waterflood.

Permission is hereby requested by application filed in accordance with the provisions of the Water Rights Act to divert water in the NW¼ Section 26-9-29 WPM by means of an earthen tank adjacent to the creek and then by pump and pipe line to lsd 9-35-9-29 WPM. Calculated diversion rates range from a maximum of 24 Imperial gallons per minute to a minimum of 12 Imperial gallons per minute. It is anticipated that the pilot flood will be conducted during mid 1966 for a period of approximately 180 days. This permission is requested subject to approval by Department of Mines and Natural Resources of the pilot flood submission.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per:

H. B. Elder, P. Engineer.

HBE/dmb

DEPARTMENT OF MINES
& NATURAL RESOURCES
MAR 22 1966
PETROLEUM ENGINEERING
DIVISION

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)
726 - 8TH AVENUE S.W.
CALGARY, ALBERTA
P.O. BOX #1240
VIRDEN, MANITOBA

DEPARTMENT OF AGRICULTURE AND CONSERVATION
MAR 21 1966
WATER CONTROL AND CONSERVATION BRANCH

March 16, 1966

Department of Agriculture and Conservation,
Water Control and Conservation Branch,
Room 405, Norquay Building,
Winnipeg, Manitoba.

Attention: J. A. Griffiths, Director.

Dear Sir:

Re: Application to divert water from
Pipestone Creek in NE¼ 26-9-29 WPM.

Paradise Petroleums Ltd. is presently preparing a submission to the Minister, Department of Mines and Natural Resources, requesting permission to conduct a pilot waterflood in sections 35 and 36, Twp. 9, Rge. 29, WPM. Ebor area, Manitoba. The submission must explain the source of water that is to be used in the pilot waterflood.

Permission is hereby requested by application filed in accordance with the provisions of the Water Rights Act to divert water in the NE¼ Section 26-9-29 WPM by means of an earthen tank adjacent to the creek and then by pump and pipe line to lsd 9-35-9-29 WPM. Calculated diversion rates range from a maximum of 24 Imperial gallons per minute to a minimum of 12 Imperial gallons per minute. It is anticipated that the pilot flood will be conducted during mid 1966 for a period of approximately 180 days. This permission is requested subject to approval by Department of Mines and Natural Resources of the pilot flood submission.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per:

H. B. Elder, P. Engineer.

HBE/cmb

PETROLEUM ENGINEERING DIVISION

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA

P.O. BOX 1327
VIRDEN, MANITOBA

March 8, 1966.

Honourable Sterling R. Lyon, Q.C.
Minister of Mines and Natural Resources,
Legislative Building,
Winnipeg 1, Manitoba.

Dear Sir:

As a representative of the royalty interest owner, The Crown, under the NW¼ of Section 36-9-29 WPM, Ebor area, Manitoba, you are undoubtedly aware that producing wells have suffered a rapid production decline. The wells are at, or near, the economic limit of production.

Paradise Petroleums Ltd. is preparing an application to the Minister, Department of Mines and Natural Resources, for permission to conduct a pilot water flood in Section 35 and 36-9-29 with Paradise N. Ebor 9-35-9-29 as the injection well. The purpose of the pilot flood is to determine if sufficient additional oil can be recovered to justify the formation of a waterflood unit.

The written consent of royalty interest owners should be included with the application. If you have no objections, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per: H. B. Elder

HBE/dmb

H. B. Elder, P. Engineer.

APPROVED THIS _____ DAY OF MARCH, 1966.

DEPARTMENT OF MINES AND NATURAL RESOURCES

Per: _____

p. c. to: **Mr. M. J. Gebert, Assistant Deputy Minister.**
Mr. F. S. Gamey, Reservoir Engineer.

PS-153

March 22, 1966.

J. S. Richards,
Director of Mines.

COPY

Mr. Charles T. Birt,
Executive Assistant
to the Minister.

Paradise Petroleums Ltd.

with Bob Edes proposed pilot water flood.

Attached, hereto, draft reply to Mr. H. B. Elder's letter, requesting consent to a pilot water flood program in Sections 35 and 36 - 9 - 29, W., for the Minister's signature.

J. S. Richards.

JSR:db

Encs.

c. c. to: Mr. M. J. Gobert,
Assistant Deputy Minister.

MR.

D PARTMENT
AND N C
MAR 22 1966

PS-4-53

# COPY

April 5, 1966

Mr. H. B. Elder, P. Engineer,
Paradise Petroleums Ltd.,
Box 1327,
Virden,
Manitoba.

Dear Mr. Elder:

This will acknowledge your letter requesting approval, on behalf of the Crown as royalty owner in respect to the N.W. 36 - 9 - 29, W., to a pilot water flood program in Sections 35 and 36 - 9 - 29, W.

The application for permission to carry out this pilot water flood project should be made to The Oil and Natural Gas Conservation Board. I feel that consent, as a royalty interest owner, should be deferred, at least, until an application has been made to the Conservation Board, at which time more would be known about your proposal.

Yours very truly,

Sterling R. Lyon,
Minister of Mines and
Natural Resources.

JSR:db

c. c. to: Mr. Stuart Anderson,
Deputy Minister.
Mr. M. J. Gobert,
Assistant Deputy Minister.

DEPARTMENT OF MINES AND NATURAL RESOURCES
ROUTE SLIP

| | |
|---|---|
| TO Mr. J. S. Richards | FROM Charles T. Birt |
| TO | FROM |

- ☐ For your approval or revision
- ☐ For your information
- ☐ Please take action
- ☐ Extracts of minutes for your information and action
- ☐ Please draft reply for signature of
- ☐ Reply direct with copy to me
- ☐ Please supply data for my reply
- ☐ Return with comments and/or recommendations
- ☐ Investigate and report
- ☐ Please sign
- ☐ Please return
- ☐ Please see me
- ☐ Please phone

DEPARTMENT OF MINES AND NATURAL RESOURCES
MAR 11 1966
DIRECTOR OF MINES

Date March 11, 1966. Subject Paradise Petroleums Limited.

Message

Not usual to consent to assign until has been forwarded and filed

May I have your comments on the

Paradise Petroleum Request.

Probably [illegible] as [illegible]

— [illegible] O&N.G. Con. Board.

MNR-A-94 Use reverse side if necessary

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA

P.O. BOX 1327
VIRDEN, MANITOBA

March 8, 1966.

Honourable Sterling R. Lyon, Q.C.
Minister of Mines and Natural Resources,
Legislative Building,
Winnipeg 1, Manitoba.

Dear Sir:

As a representative of the royalty interest owner, The Crown, under the NW¼ of Section 36-9-29 WPM, Ebor area, Manitoba, you are undoubtedly aware that producing wells have suffered a rapid production decline. The wells are at, or near, the economic limit of production.

Paradise Petroleums Ltd. is preparing an application to the Minister, Department of Mines and Natural Resources, for permission to conduct a pilot water flood in Section 35 and 36-9-29 with Paradise N. Ebor 9-35-9-29 as the injection well. The purpose of the pilot flood is to determine if sufficient additional oil can be recovered to justify the formation of a waterflood unit.

The written consent of royalty interest owners should be included with the application. If you have no objections, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per: H. B. Elder

HBE/dmb

H. B. Elder, P. Engineer.

APPROVED THIS _____ DAY OF MARCH, 1966.

DEPARTMENT OF MINES AND NATURAL RESOURCES

Per: _____

p. c. to: Mr. M. J. Gobert, Assistant Deputy Minister.

DEPARTMENT OF MINES AND NATURAL RESOURCES
ROUTE SLIP

TO M. J. Gobert | FROM P.S.G.

TO Room 1010 | FROM

- ☐ For your approval or revision
- ☐ For your information
- ☐ Please take action
- ☐ Extracts of minutes for your information and action
- ☐ Please draft reply for signature of
- ☐ Reply direct with copy to me
- ☐ Please supply data for my reply
- ☐ Return with comment and/or recommendations
- ☐ Investigate and report
- ☐ Please sign
- ☐ Please return
- ☐ Please see me
- ☐ Please phone

DEPARTMENT OF MINES AND NATURAL RESOURCES
MAR 23 1966
ASSISTANT DEPUTY MINISTER OFFICE

Date | Subject

Message Copy of letter to WATER CONTROL requesting use of Pipestone Creek for source of water

Paradise Pilot water flood -

1 copy on file in Petroleum Division

MNR-A-94 Use reverse side if necessary

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA
P.O. BOX #1240
VIRDEN, MANITOBA

WATER CONTROL AND CONSERVATION
MAR 21 1966
WATER CONTROL AND CONSERVATION BRANCH

March 16, 1966

Department of Agriculture and Conservation,
Water Control and Conservation Branch,
Room 405, Norquay Building,
Winnipeg, Manitoba.

Attention: J. A. Griffiths, Director.

Dear Sir:

Re: Application to divert water from
Pipestone Creek in NE¼ 26-9-29 WPM.

Paradise Petroleums Ltd. is presently preparing a submission to the Minister, Department of Mines and Natural Resources, requesting permission to conduct a pilot waterflood in sections 35 and 36, Twp. 9, Rge. 29, WPM. Elgin area, Manitoba. The submission must explain the source of water that is to be used in the pilot waterflood.

Permission is hereby requested by application filed in accordance with the provisions of the Water Rights Act to divert water in the NE¼ Section 26-9-29 WPM by means of an earthen tank adjacent to the creek and then by pump and pipe line to 1sd 2-35-9-29 WPM. Calculated diversion rates range from a maximum of 24 Imperial gallons per minute to a minimum of 12 Imperial gallons per minute. It is anticipated that the pilot flood will be conducted during mid 1966 for a period of approximately 180 days. This permission is requested subject to approval by Department of Mines and Natural Resources of the pilot flood submission.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per:

H. B. Elder, P. Engineer.

HBE/dmb

DEPARTMENT OF MINES & NATURAL RESOURCES
MAR 22 1966
PETROLEUM ENGINEERING DIVISION

March 22, 1966.

J. S. Richards,
Director of Mines.

Mr. Charles T. Birt,
Executive Assistant
to the Minister.

Paradise Petroleums Ltd.

DEPARTMENT OF MINES
& NATURAL
APR 5 - 1966
DIRECTOR OF MINES

Attached, hereto, draft reply to Mr. H. B. Elder's letter, requesting consent to a pilot water flood program in Sections 35 and 36 - 9 - 29, W., for the Minister's signature.

J. S. Richards.

JSR:db

Encs.

c. c. to: Mr. M. J. Gobert,
Assistant Deputy Minister.

Mr. F. S. Gamey,
Reservoir Engineer.

**DEPARTMENT OF MINES AND NATURAL RESOURCES**
**ROUTE SLIP**

TO Mr. J. S. Richards | FROM Charles T. Birt

TO | FROM

- ☐ For your approval or revision
- ☐ For your information
- ☐ Please take action
- ☐ Extracts of minutes for your information and action
- ☐ Please draft reply for signature of
- ☐ Reply direct with copy to me
- ☐ Please supply data for reply
- ☐ Return with comments and/or recommendations
- ☐ Investigate and report
- ☐ Please sign
- ☐ Please return
- ☐ Please see me
- ☐ Please phone

DEPARTMENT OF MINES AND NATURAL RESOURCES
MAR 15 1966
DIRECTOR OF MINES

Date March 11, 1966. Subject Paradise Petroleums Limited.

Message

Not usual to consent to plan until plan has been forwarded and signed

May I have your comments on the

Paradise Petroleum Request.

Probably no objections - as Royalty Clause.

- must apply to the Ob. & G. Con. Board.

MNR-A-94 Use reverse side if necessary

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA

P.O. BOX XXXX #1240
VIRDEN, MANITOBA

RECEIVED
MAR 14 1966
Canada Permanent Trust Co.
PORTAGE AVE.

March 11, 1966

Canada Permanent Trust Company
433 Portage Avenue
Winnipeg, Manitoba.

Dear Sirs:

As a royalty interest owner under the SE¼ of Section 36-9-29 WPM, Ebor area, Manitoba, you are undoubtedly aware that producing wells have suffered a rapid production decline. The wells are at, or near, the economic limit of production.

Paradise Petroleums Ltd. is preparing an application to the Minister, Department of Mines and Natural Resources, for permission to conduct a pilot water flood in Section 35 and 36-9-29 with Paradise N. Ebor 9-35-9-29 as the injection well. The purpose of the pilot flood is to determine if sufficient additional oil can be recovered to justify the formation of a waterflood unit.

The written consent of royalty interest owners should be included with the application. If you have no objections, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per: H. B. Elder

H. B. Elder, P. Engineer.

HBE/dmb

APPROVED THIS 6th DAY OF ~~MARCH~~ June, 1966.

~~THE~~ CANADA PERMANENT TRUST COMPANY

Per: C. R. Little
Assistant MANAGER AT WINNIPEG BRANCH

ASSISTANT MANAGER AT WINNIPEG BRANCH

EXHIBIT NO. 2
OIL & N. GAS CONSERVATION BOARD
DATE Jan 8, 1966
HEARING Brandon

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA

P.O. BOX ~~XXXX~~ #1240
VIRDEN, MANITOBA

RECEIVED
MAR 14 1966
Canada Permanent Trust Company
Winnipeg, Man.

March 11, 1966

Canada Permanent Trust Company
433 Portage Avenue
Winnipeg, Manitoba.

Dear Sirs:

As a royalty interest owner under the SE¼ of Section 36-9-29 WPM, Ebor area, Manitoba, you are undoubtedly aware that producing wells have suffered a rapid production decline. The wells are at, or near, the economic limit of production.

Paradise Petroleums Ltd. is preparing an application to the Minister, Department of Mines and Natural Resources, for permission to conduct a pilot water flood in Section 35 and 36-9-29 with Paradise N. Ebor 9-35-9-29 as the injection well. The purpose of the pilot flood is to determine if sufficient additional oil can be recovered to justify the formation of a waterflood unit.

The written consent of royalty interest owners should be included with the application. If you have no objections, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per: H. B. Elder

H. B. Elder, P. Engineer.

HBE/dmb

APPROVED THIS 6th DAY OF ~~MARCH~~ June, 1966.

~~THE~~ CANADA PERMANENT TRUST COMPANY

Per: [illegible]
Assistant MANAGER AT WINNIPEG BRANCH

[illegible]
ASSISTANT MANAGER AT WINNIPEG BRANCH

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA

P.O. BOX ~~XXXX~~ #1240
VIRDEN, MANITOBA

RECEIVED
MAR 14 1966
Canada Permanent Trust Co.
Winnipeg, Man.

March 11, 1966

Canada Permanent Trust Company
433 Portage Avenue
Winnipeg, Manitoba.

Dear Sirs:

As a royalty interest owner under the SE¼ of Section 36-9-29 WPM, Ebor area, Manitoba, you are undoubtedly aware that producing wells have suffered a rapid production decline. The wells are at, or near, the economic limit of production.

Paradise Petroleums Ltd. is preparing an application to the Minister, Department of Mines and Natural Resources, for permission to conduct a pilot water flood in Section 35 and 36-9-29 with Paradise N. Ebor 9-35-9-29 as the injection well. The purpose of the pilot flood is to determine if sufficient additional oil can be recovered to justify the formation of a waterflood unit.

The written consent of royalty interest owners should be included with the application. If you have no objections, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per: N. B. Elder, P. Engineer.

NBE/dmb

APPROVED THIS 6th DAY OF ~~MARCH~~ June, 1966.

~~THE~~ CANADA PERMANENT TRUST COMPANY

Per: MANAGER AT WINNIPEG BRANCH

ASSISTANT MANAGER AT WINNIPEG BRANCH

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA

P.O. BOX 1397 #1240
VIRDEN, MANITOBA

March 8, 1966.

Canada Permanent Trust Company
433 Portage Avenue
Winnipeg 2, Manitoba.

Gentlemen:

As a royalty interest owner under the SE¼ of Section 35-9-29 WPM, Ebor area, Manitoba, you are undoubtedly aware that producing wells have suffered a rapid production decline. The wells are at, or near, the economic limit of production.

Paradise Petroleums Ltd. is preparing an application to the Minister, Department of Mines and Natural Resources, for permission to conduct a pilot water flood in Section 35 and 36-9-29 with Paradise N.Ebor 9-35-9-29 as the injection well. The purpose of the pilot flood is to determine if sufficient additional oil can be recovered to justify the formation of a waterflood unit.

The written consent of royalty interest owners should be included with the application. If you have no objections, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per: H. B. Elder

H. B. Elder, P. Engineer.

HBE/dmb

APPROVED THIS 6th DAY OF June, 1966.

CANADA PERMANENT TRUST COMPANY

Per: [illegible]
Assistant MANAGER AT WINNIPEG BRANCH

[illegible]
ASSISTANT MANAGER AT WINNIPEG BRANCH

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA

P.O. BOX 1327
VIRDEN, MANITOBA

March 8, 1966.

Honourable Sterling R. Lyon, Q.C.
Minister of Mines and Natural Resources,
Legislative Building,
Winnipeg 1, Manitoba.

Dear Sir:

As a representative of the royalty interest owner, The Crown, under the NE¼ of Section 36-9-29 WPM, Ebor area, Manitoba, you are undoubtedly aware that producing wells have suffered a rapid production decline. The wells are at, or near, the economic limit of production.

Paradise Petroleums Ltd. is preparing an application to the Minister, Department of Mines and Natural Resources, for permission to conduct a pilot water flood in Section 35 and 36-9-29 with Paradise N. Ebor 9-35-9-29 as the injection well. The purpose of the pilot flood is to determine if sufficient additional oil can be recovered to justify the formation of a waterflood unit.

The written consent of royalty interest owners should be included with the application. If you have no objections, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per: H. B. Elder

HBE/dmb

H. B. Elder, P. Engineer.

APPROVED THIS _____ DAY OF MARCH, 1966.

DEPARTMENT OF MINES AND NATURAL RESOURCES

Per: _____

p. c. to: Mr. M. J. Gobert, Assistant Deputy Minister.
Mr. F. S. Gamey, Reservoir Engineer.

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)
736 - 8TH AVENUE S.W.
CALGARY, ALBERTA

P.O. BOX ~~3327~~ #1240
VIRDEN, MANITOBA

March 8, 1966.

Canada Permanent Trust Company
433 Portage Avenue
Winnipeg 2, Manitoba.

Gentlemen:

As a royalty interest owner under the SE¼ of Section 35-9-29 WPM, Ebor area, Manitoba, you are undoubtedly aware that producing wells have suffered a rapid production decline. The wells are at, or near, the economic limit of production.

Paradise Petroleums Ltd. is preparing an application to the Minister, Department of Mines and Natural Resources, for permission to conduct a pilot water flood in Section 35 and 36-9-29 with Paradise N.Ebor 9-35-9-29 as the injection well. The purpose of the pilot flood is to determine if sufficient additional oil can be recovered to justify the formation of a waterflood unit.

The written consent of royalty interest owners should be included with the application. If you have no objections, please sign and return two copies of this letter.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per: H. B. Elder

HBE/dmb

H. B. Elder, P. Engineer.

APPROVED THIS 6th DAY OF ~~March~~ June, 1966.

CANADA PERMANENT TRUST COMPANY

Per: [illegible]
Assistant MANAGER AT WINNIPEG BRANCH

[illegible]
ASSISTANT MANAGER AT WINNIPEG BRANCH

EXHIBIT NO. 1
OIL & N. GAS CONSERVATION BOARD
DATE June 8, 1966
HEARING [illegible]

January 24, 1966

Paradise Petroleums Ltd.,
P.O.Box 1240,
Virden, Manitoba.

Att: Mr. H.B. Elder

Dear Sir:

Mr. T.E. Weber advises me that written authority is required before water from the Pipestone Creek may be used in the Ebor and North Ebor pilot water flood mentioned in your letter of January 20, 1966.

Mr. Weber as Chief Engineer, Water Control and Conservation Branch, Department of Agriculture and Conservation refers to subsection 2A of Section 6 of The Water Rights Act which provides:

"6 (2A) No person shall

(a) divert or impound any surface water not flowing in a natural channel or contained in a natural bed; or

(b) construct, or cause to be constructed, any works for the diversion or impounding of water to which clause (a) applies; or

(c) alter the levels, grades, or surface of his land in such a way as to do anything to which reference is made in clause (a);

without having first obtained from the Minister written authority to do so."

Paradise Petroleums Ltd.,
P.O.Box 1240,
Virden, Manitoba.



A copy of the application is attached for your convenience.

I presume that you have considered the possibility that there might be excess produced salt water available at batteries on the West flank of the Daly Field.

With respect to the pilot water flood, an application to the Oil and Natural Gas Conservation Board is required. This application should be supported by a fairly complete engineering and geological study together with the written consents, of the working interest and royalty interest owners involved, to the plan. After published notice, a public hearing would then be held.

For your information, copies of data presented at the public hearing held to consider the pilot water flood in the Ebor Field and the Board Orders issued subsequently are enclosed.

If I can be of any assistance please do not hesitate to ask.

Yours very truly,

M.J.Gobert
Assistant Deputy Minister

MJG/js
Att.

# PARADISE PETROLEUMS LTD.

(No Personal Liability)

Phones: 390
342
Nights - 85

J. W. CLARKE, President
J. F. HIGGINBOTHAM, Vice-Pres.
B. N. WATSON, Secretary

P.O. Box ~~1120~~ #1240
VIRDEN, Manitoba

January 20, 1966

Department of Mines and Natural Resources,
Mines Branch,
9th Floor, Norquay Building,
401 York Avenue,
Winnipeg 1, Manitoba.

Attention: M. J. Gobert.

Dear Sir:

Paradise Petroleums Ltd. is investigating the feasibility of a pilot water flood in the Ebor and North Ebor area of Township Nine, Range Twenty-nine, WPM. Since the volume of water required for this project exceeds the volume of salt water produced in the area, the use of fresh water from nearby Pipestone creek is being considered.

Would you please advise the proper procedure in requesting permission for a pilot flood and the proper authorities to contact if it should be desired to use fresh water from Pipestone creek.

Yours very truly,

PARADISE PETROLEUMS LTD.

Per: H B Elder

HBE/dmb

H. B. Elder, P. Engineer.

Jan 21/66
Phoned J. Wicks and he advised being is required under Section 6 of the amended Water Rights Act. and forwarded the necessary forms Dmb.

DEPARTMENT OF MINES AND NATURAL RESOURCES
JAN 21 1966
ASSISTANT DEPUTY MINISTER
GENERAL

PROVINCE OF MANITOBA

DEPARTMENT OF AGRICULTURE AND CONSERVATION

WATER CONTROL AND CONSERVATION BRANCH

APPLICATION FILED IN ACCORDANCE WITH THE
PROVISIONS OF THE WATER RIGHTS ACT

THE APPLICATION OF .....

Living in the ..... or on the .....
Village, Town, etc.

Quarter of Section ..... Township ..... Range .....

West
of the ..... Meridian in the Province of Manitoba
East

SHOWING:

1. That the name and residence of the applicant are set forth above, and

his
that occupation is .....
her

his
and Post Office address is .....
her

2. That the applicant asks for authority under the provisions of The Water Rights Act to:

(a) construct a water well located on the following land:

.....

.....,

and/or as indicated on the attached sketch or plan.

(b) divert water from an underground aquifer by means of

a pump and the said water well for .....
(municipal,

..... purposes on the
industrial, irrigation, other)

following land: .....

.....

.....,

and at the following maximum rates:

(i) ..... Imperial gallons per minute

(ii) ..... Imperial gallons per day

(iii) ..... Imperial gallons per year

(over)

3. That the lands affected are held by the applicant as follows:

(a) Owns the following lands (as registered owner) viz.:

.....

.....

.....

(b) Holds the following lands under agreement for sale, viz.:

.....

.....

.....

(c) Holds the following lands under lease from ..... viz.:

.....

.....

.....

(d) Was granted the undernoted rights to the following lands by agreements from ..... viz.:

.....

.....

.....

Dated at ..... this ..... day of ..... 19....

.....
Applicant

TO THE DIRECTOR OF WATER CONTROL AND CONSERVATION,
WINNIPEG, MANITOBA.

CERTIFIED as the Application filed with the DIRECTOR OF WATER CONTROL AND CONSERVATION at Winnipeg, Manitoba, this ..... day of ..... 19....

.....
Director.

PROVINCE OF MANITOBA

DEPARTMENT OF AGRICULTURE AND CONSERVATION

WATER CONTROL AND CONSERVATION BRANCH

APPLICATION FILED IN ACCORDANCE WITH THE
PROVISIONS OF THE WATER RIGHTS ACT

THE APPLICATION OF .....

Living in the ..... or on the .....
Village, Town, etc.

Quarter of Section ..... Township ..... Range .....

West
of the ..... Meridian in the Province of Manitoba
East

SHOWING:

1. That the name and residence of the applicant are set forth above, and

that his / her occupation is .....

and his / her Post Office address is .....

2. That the applicant asks for authority under the provisions of the Water Rights Act to:

(a) construct a dam for the impoundment of water in .....
(name of river, creek,

....., and located on .....
etc.)

.....
(description of land)

.....

and as more particularly shown on the attached sketch or plan.

(b) divert water from .....
(name of river, creek, etc.)

..... by means of .....

.....
(pump and/or pipeline, canal, etc.)

located on .....
(description of land)

.....

for ..... purposes
(domestic, municipal, industrial, irrigation, other)

(over)

A-wr-10

on .....
(description of land)

.....,

and at the following maximum rates:

(a) ..... Imperial gallons per minute

(b) ..... Acre feet per day

(c) ..... Acre feet per year

3. That the lands affected are held by the applicant as follows:

(a) Owns the following lands (as registered owner) viz.:

.....

.....

.....

(b) Holds the following lands under agreement for sale, viz.:

.....

.....

.....

(c) Holds the following lands under lease from .....
viz.:

.....

.....

.....

(d) Was granted the undernoted rights to the following lands by agreements from ..... viz.:

.....

.....

Dated at ..... this ..... day of
..... 19....

.....
Applicant

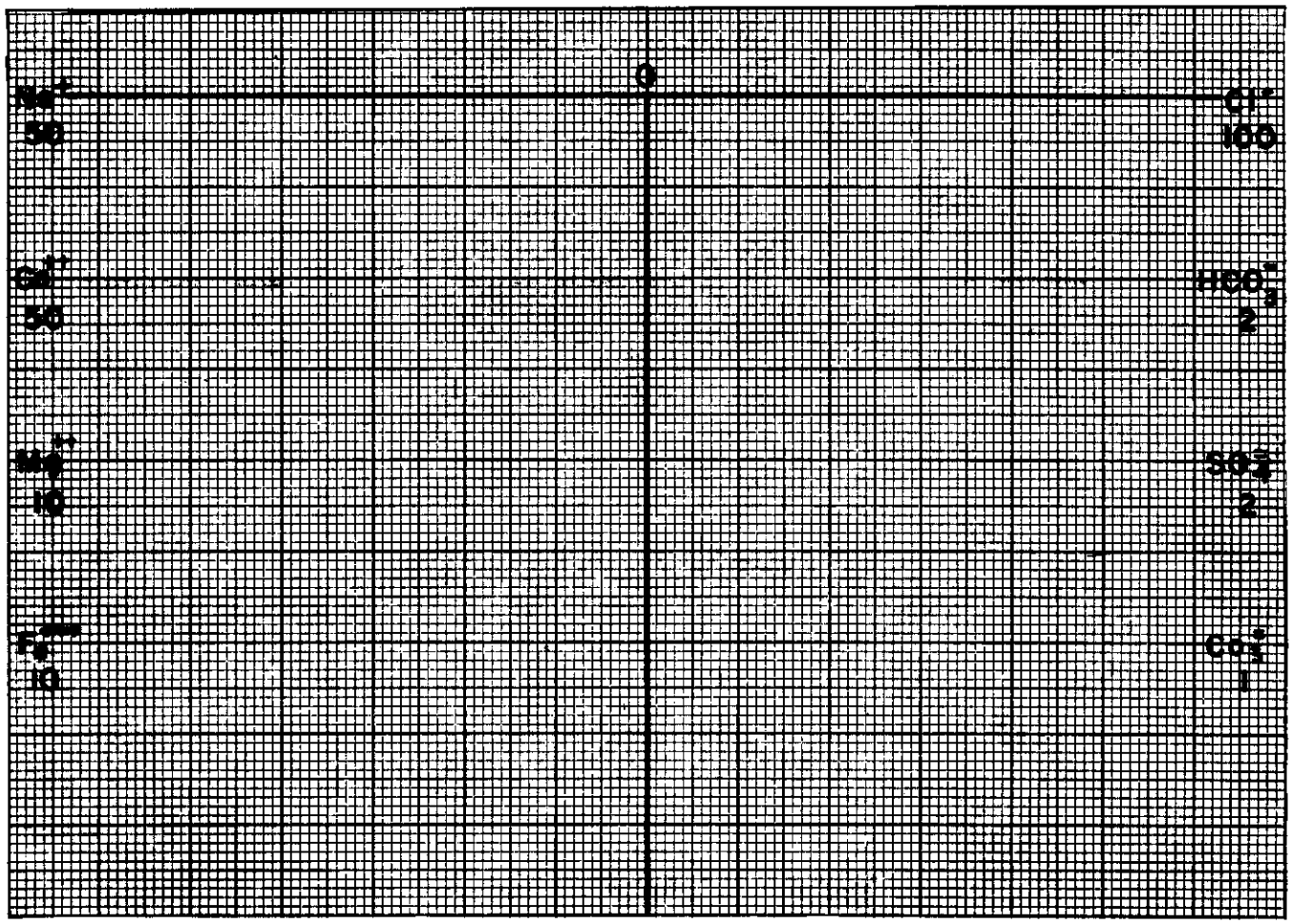
TO THE DIRECTOR OF WATER CONTROL AND CONSERVATION,
WINNIPEG, MANITOBA.

CERTIFIED as the Application filed with the DIRECTOR OF WATER CONTROL AND CONSERVATION at Winnipeg, Manitoba, this .....
day of ..... 19....

.....
Director.

# SALT WATER PATTERN ANALYSIS

FIELD Ebor FORMATION Texas Ebor 2-36-9-29




SAMPLE DETAILS

FIELD: Ebor WELL No. Texas Ebor 2-36-9-29

FORMATION: Miss. Lodgepole DEPTH: HOW SAMPLED: Treater

ANALYSED BY: Mines Branch Lab. DATE: 19 Apr.65 LAB. No. M-3572

REMARKS: Depth. 2544-2562

PARTS PER MILLION

| Na,K | Ca | Mg | Fe | $SO_4$ | Cl | $CO_3$ | $HCO_3$ | OH | $H_2S$ |
|---|---|---|---|---|---|---|---|---|---|
| 62076 | 2388 | 667 | Nil | 5237 | 97966 | Nil | 85 | - | - |

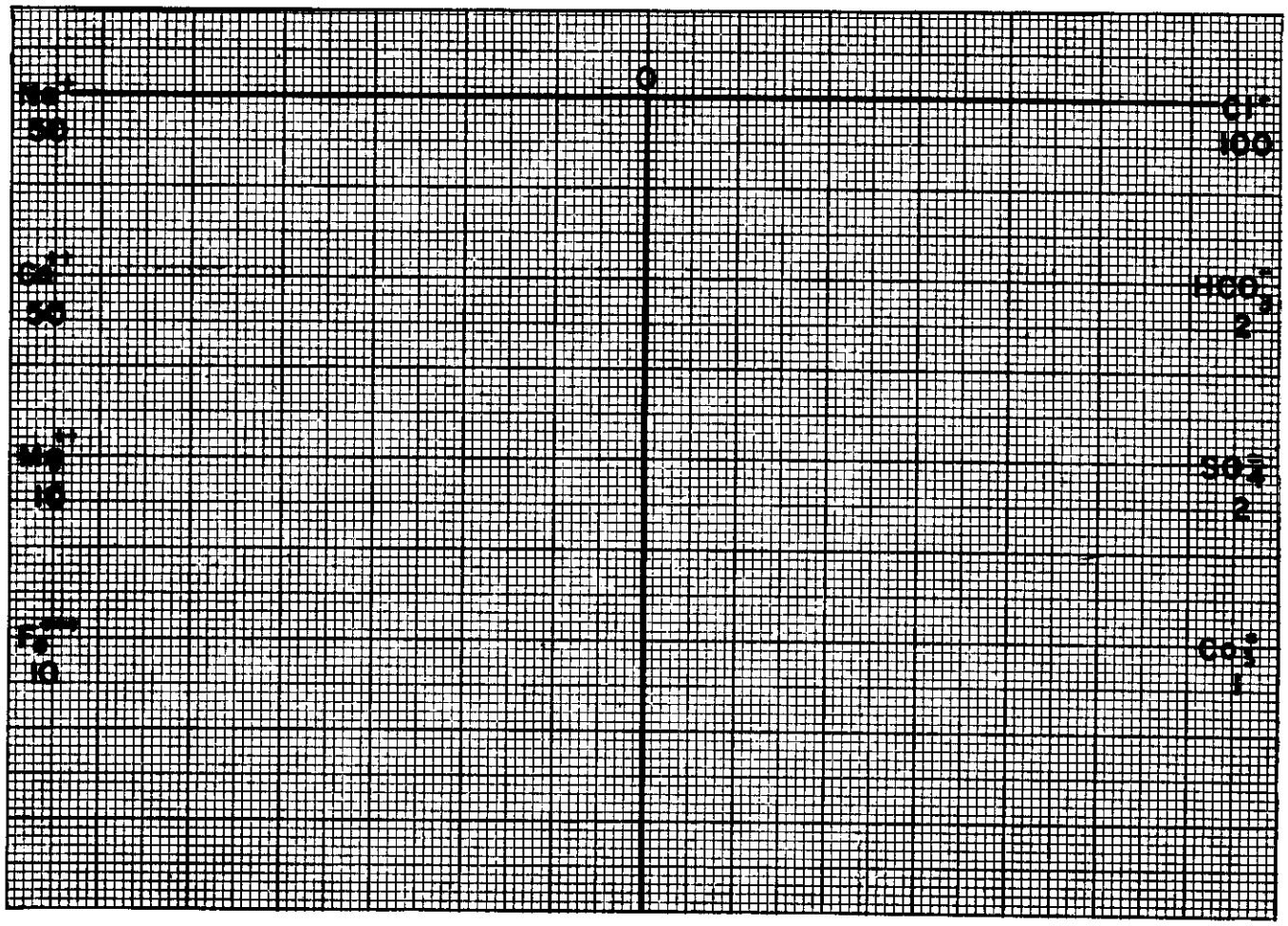
MILLIGRAM EQUIVALENTS

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2699.1 | 119.2 | 54.9 | - | 109. | 2762.6 | - | 1.4 | | |

| | | | |
|---|---|---|---|
| Sp. Gr. 1.116 @ 60° F. | Observed pH 7.15 | Resistivity 0.054 ohm-meters @ | 76° °F |

# SALT WATER PATTERN ANALYSIS

**FIELD** North Ebor **FORMATION** Mississippian Lodgepole




## SAMPLE DETAILS

FIELD: North Ebor WELL No. 9-35-9-29

FORMATION: Miss. Lodgepole DEPTH: _____ HOW SAMPLED: Treater

ANALYSED BY: Mines Branch Lab. DATE: 19 Apr. 65 LAB. No. M-3571

REMARKS: Five Wells, 2560' - 2600' PRODUCER DEC 30/64
CUM. WATER - 1653 bbls

## PARTS PER MILLION

| Na,K | Ca | Mg | Fe | $SO_4$ | Cl | $CO_3$ | $HCO_3$ | OH | $H_2S$ |
|---|---|---|---|---|---|---|---|---|---|
| 32379 | 2025 | 612 | Nil | 4665 | 51606 | 12 | 390 | | |

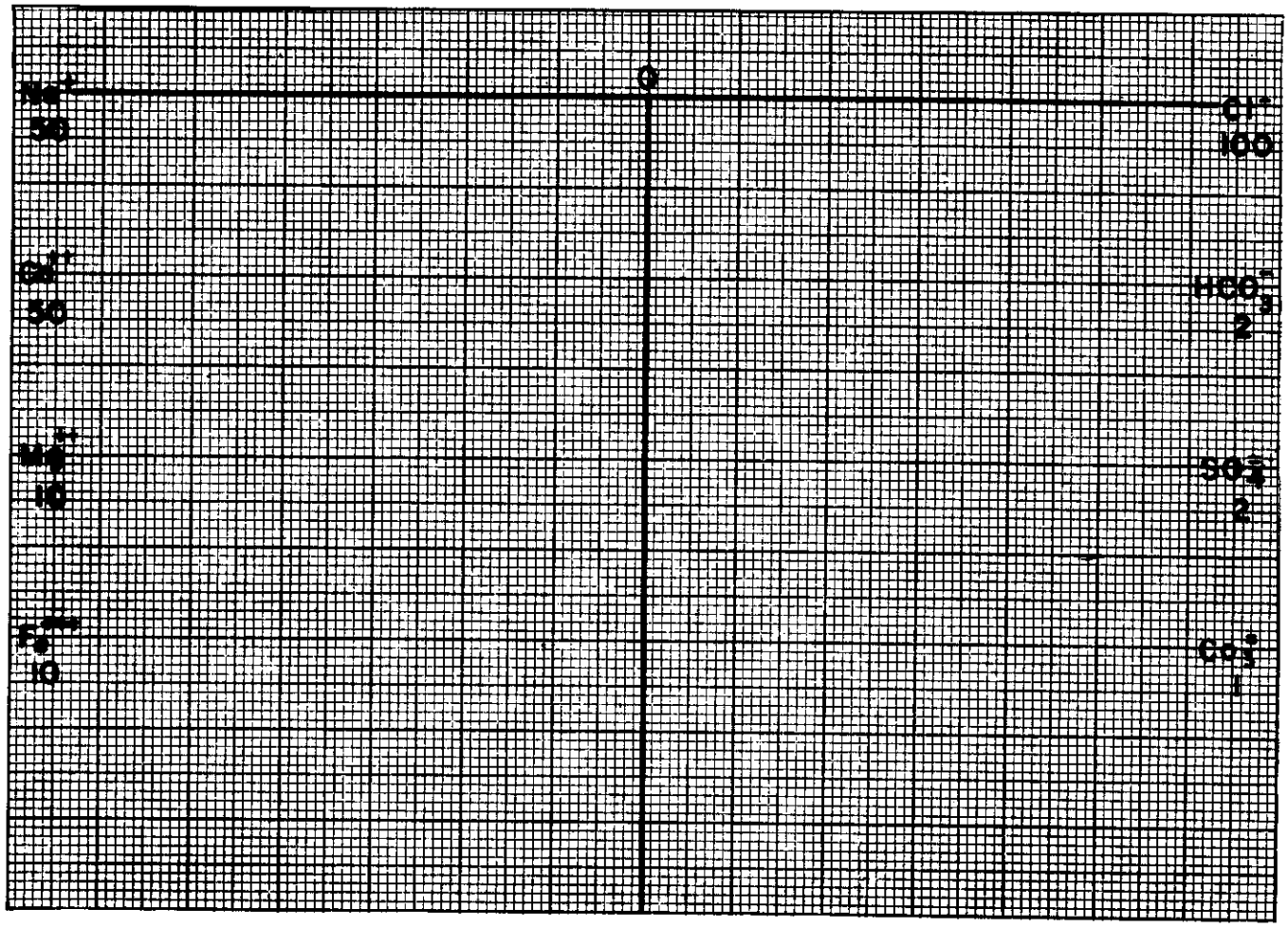
## MILLIGRAM EQUIVALENTS

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1407.8 | 101 | 50.3 | - | 97.1 | 1455.3 | 0.4 | 6.4 | | |

| | | | |
|---|---|---|---|
| Sp. Gr. @ 60°F. 1.008 | Observed pH 8.05 | Resistivity 0.087 ohm-meters @ 75° °F | |

# SALT WATER PATTERN ANALYSIS

FIELD _____ FORMATION _____




SAMPLE DETAILS

FIELD: _____ WELL No. Paradise North Ebor 13-36-9-29

FORMATION: Mississippian DEPTH: 2556-2580 HOW SAMPLED: _____

ANALYSED BY: _____ DATE: June 14/65 LAB. No. M-3601

REMARKS: 17 A North Ebor (Area)

PARTS PER MILLION

| Na,K | Ca | Mg | Fe | $SO_4$ | Cl | $CO_3$ | $HCO_3$ | OH | $H_2S$ |
|---|---|---|---|---|---|---|---|---|---|
| 20,329 | 1,502 | 536 | - | 4,780 | 31,695 | Nil | 586 | | |

MILLIGRAM EQUIVALENTS

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

| | | |
|---|---|---|
| Sp. Gr. 1.046 | Observed pH 7.0 | Resistivity 0.123 ohm-meters @ 78 °F |

PHONE 26

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)

P. O. BOX 2,
VIRDEN, MANITOBA

J. W. CLARKE, President
J. F. HIGGINBOTHAM, Vice-Pres.
R. V. ANDREW, Sec'y.-Treas.



or when we find it, uneconomical to operate the well as either a Disposal, Dual or producing well.

Our first objective will be to try to produce this well, failing this we need a disposal well in that area, and thirdly we may attempt to convert this well to a Dual Well.

We give you this information in the interest of all concerned with particular reference to that immediate area, and trust you will give this matter your immediate consideration.

Yours very truly,

J. W. Clarke

J. W. Clarke, Pres.

Paradise Petroleums Ltd.

cc Mr. Gobert.
/ Mr. Richards.

DEPARTMENT OF MINES
AND NATURAL RESOURCES
OCT - 5 1959
DIRECTOR OF MINES

PHONE 26

PARADISE PETROLEUMS LTD.
(NO PERSONAL LIABILITY)

P. O. BOX 2,
VIRDEN, MANITOBA

J. W. CLARKE, President
J. F. HIGGINBOTHAM, Vice-Pres.
R. V. ANDREW, Sec'y.-Treas.

October 2, 1959

Mines & Natural Resources Branch,
Mr. J. G. Cowan,
Chairman, Oil & Natural Gas
Conservation Board,
Legislative Building,
Winnipeg, Manitoba.

Dear Sirs Re: 7-26-9-25 W1

Our Company has negotiated with The British American Oil Company at Regina to purchase the above mentioned well. The Hudson Bay Oil and Gas Company are owners of the minerals under this parcel.

It appeared that a deal was forthcoming but in the past month said deal has stalemated and it now appears as though British American Oil are going to abandon this well.

Our company feel that we could produce oil in quantities sufficient to warrant its operation. We have two wells on the same section and have a letter from The Hudson Bay Company stating they would be prepared to permit Commingling of the oil into our tank at 6-26. Were these three wells more or less tied together then it is our opinion we should put additional equipment at our No. 6-26 battery.

Another reason we feel this well should not be abandoned is that a Salt Water Well will be essential to that immediate area if any possible further development may be expected.

It may be quite possible to make such a well into a Salt Water disposal or a dual well thus permitting disposal of Salt Water as well as producing oil.

Our Company has negotiated with the Scottish Canadian Surities Company a One thousand dollar Bond to be deposited with the Mines Branch to take care of abandonment if and when this is necessary,