

MAR 19660008: EAST CENTRAL ALBERTA

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POTASH PROSPECTING PERMIT #5
REPORT

By A. E. Brownless, Prof. Geologist

ECONOMIC MINERALS
FILE REPORT No.

POT-AF-005(1)

19660006

POTASH PROSPECTING PERMIT # 5

ECONOMIC MINERALS

FILE REPORT No.

POT-AF-005(1)General

The economical production of potash over a large area of Saskatchewan recently widened the search for this mineral into Manitoba and North Dakota. The identical geological stratigraphic sequence and depositional environment that resulted in the deposition of potash in Saskatchewan is also present in a large portion of Alberta.

A detailed study of this portion of Alberta showed the presence of small irregular veinlets of potassium minerals in the Lesser Slave Lake area of North Central Alberta and a substantial quantity of carnallite ($K Cl Mg Cl_2 \cdot 6 H_2O$) and possibly sylvite ($K Cl$) in the Vermillion area in the East Central Plains of Alberta. Another indication of potash was noted in the Canadian Seaboard Ernestina Lake 10-13-60-4 W4 well. This indication occurred as deflections on the gamma ray neutron log over the following intervals, 2637 - 2644 feet, 2681 - 2688 feet, 3210-3220 feet and 3490-3500 feet at this location. It was on the basis of these deflections, which indicate the presence of potash minerals, that Potash Prospecting Permit # was obtained.

Geology

Potash deposits are found in the Prairie Evaporite section of the Middle Devonian Elk Point Basin. The potash minerals occur mainly in two forms - sylvite and carnallite. Sylvite is the more valuable mineral due to its more simple composition which requires less treatment.

Literature made available from the Alberta Conservation Board and the Dominion Government on the initial well VCO #15 in Lsd. 6, Sec. 12, Twp. 49, Rge. 6 W4 indicated the presence of potash minerals.

Core descriptions mentions pinkish and greyish minerals which in all probability could be carnallite and sylvite. The cores from the well, containing the potash have been lost and dispersed since the well was drilled in 1944-1945. These cores were exposed for weeks to the atmosphere before being spot analyzed. However, the analyses do indicate traces of potassium chloride and magnesium chloride indicating the presence of sylvite and/or carnallite. It is possible to assume that due to the high solubility of sylvite, a true and accurate analysis was not obtained.

The potash minerals in the VCO #15 well are of the same composition and depositional sequence and depth as the potash at Unity, Saskatchewan. Carnallite is described twice in the sample descriptions of the Seaboard Ernestina Lake well. These occur in the Cold Lake and Lotsberg Salt sequences of the Elk Point, which are not present in Saskatchewan.

Two pronounced gamma ray and neutron deflections occur in the Prairie Evaporite section at 2637-2644 feet and 2681-2688 feet in this well, and could be an extension of the Unity and/or Vermilion deposit.

Conclusions

The writer believes that the deflections in the Ernestina well are due to carnallite. Several geologists and well log experts who have considerable experience in the potash deposits of Saskatchewan are in full agreement. This does not preclude the possibility of finding sylvite in the Ernestina Lake area of Alberta.

Carnallite would not be economical to mine at this depth due to the high content of shale requiring considerable treatment and beneficiation to compete with the present production from Saskatchewan. It would require considerable drilling and coring of the salt section to determine the presence of a sufficiently large deposit to warrant the establishment of a mine and plant.

The writer believes that salt solution has taken place in this area of Alberta and that many of the Paleozoic "highs" can be attributed to this phenomena. These "highs" would then be the most favorable areas in which to explore for potash deposits as they would be the areas of least solution. The Ernestina deposit occurs on a Paleozoic "high" which could be erosional or due to salt solution. If this "high" is due to undissolved salt, then it should be a more favorable area to explore for potash minerals. All evidence both from the well logs and samples indicates the carnallite is the only potash mineral present. The writer suggests that this occurrence of potash is not shallow enough for economical exploitation at this time.

There has been one well drilled in the general area which went into the Elk Point since the Permit was acquired. This well is a brine well drilled under section 20A of the Act and therefore can be held confidential for 5 years. The writer was unable to obtain any pertinent data on this well which would indicate the presence of sylvite in the area.

Present information obtained from the VCO #15 and Ernestina Lake wells suggests the presence of a potash deposit which in all probability consists mainly of carnallite. A deposit consisting mainly of this mineral would not be economical to mine at this depth.


E. A. Brownless

ENCLOSURES

- (1) Cross-Section of Potash Producing Areas
- (2) Structure Contours on Top of Paleozoic

References

- (1) Potash in Saskatchewan- Department of Mines, Saskatchewan
- (2) Tompkins, R. (1955)
- (3) A.S.P.G. Atlas (1965)
- (4) Schlumberger Alger - 1965

73L/112+7

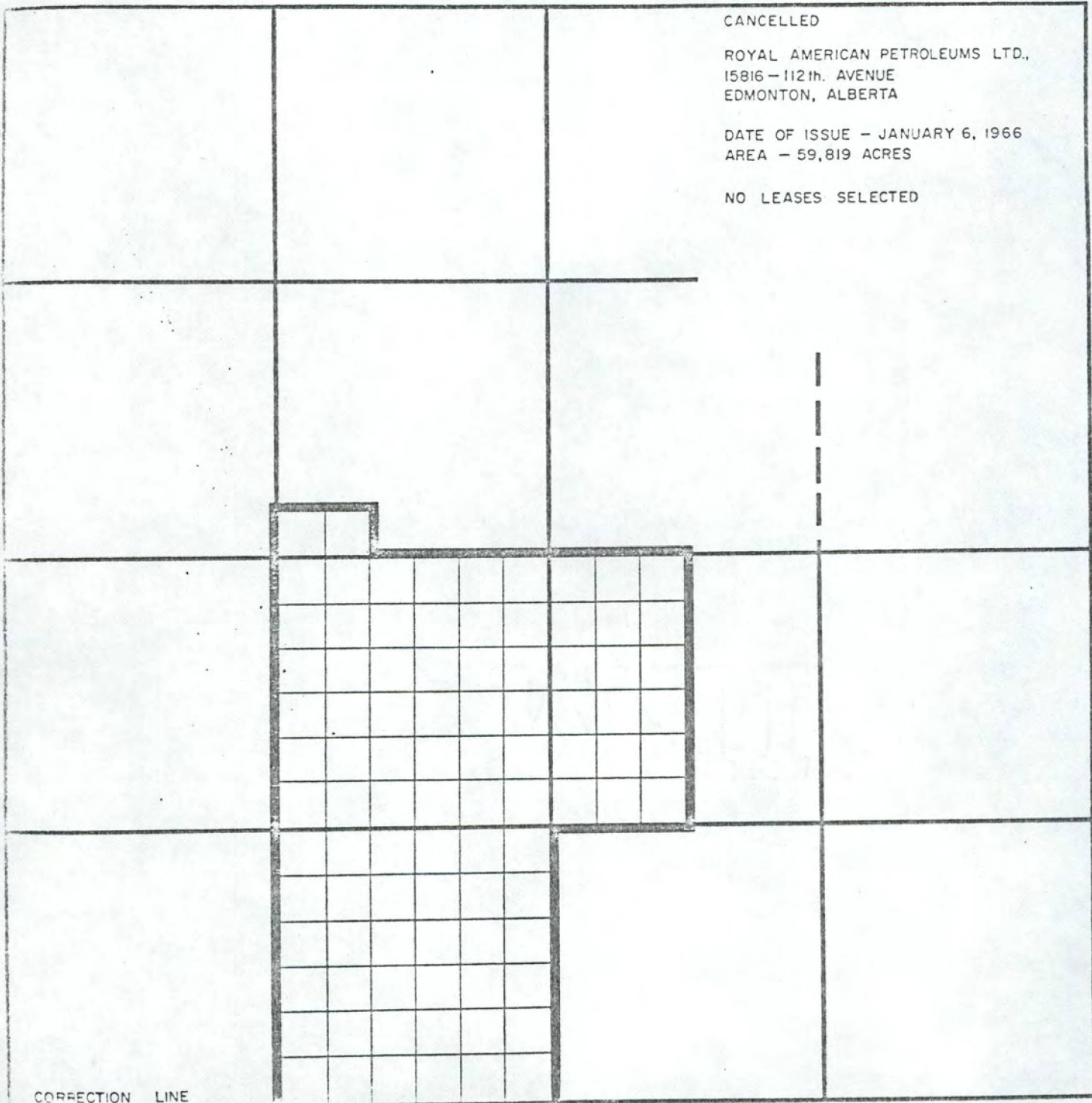
POTASH PROSPECTING PERMIT No.5

CANCELLED

ROYAL AMERICAN PETROLEUMS LTD.,
15816 - 112th. AVENUE
EDMONTON, ALBERTA

DATE OF ISSUE - JANUARY 6, 1966
AREA - 59,819 ACRES

NO LEASES SELECTED



CORRECTION LINE

R.4

R.3

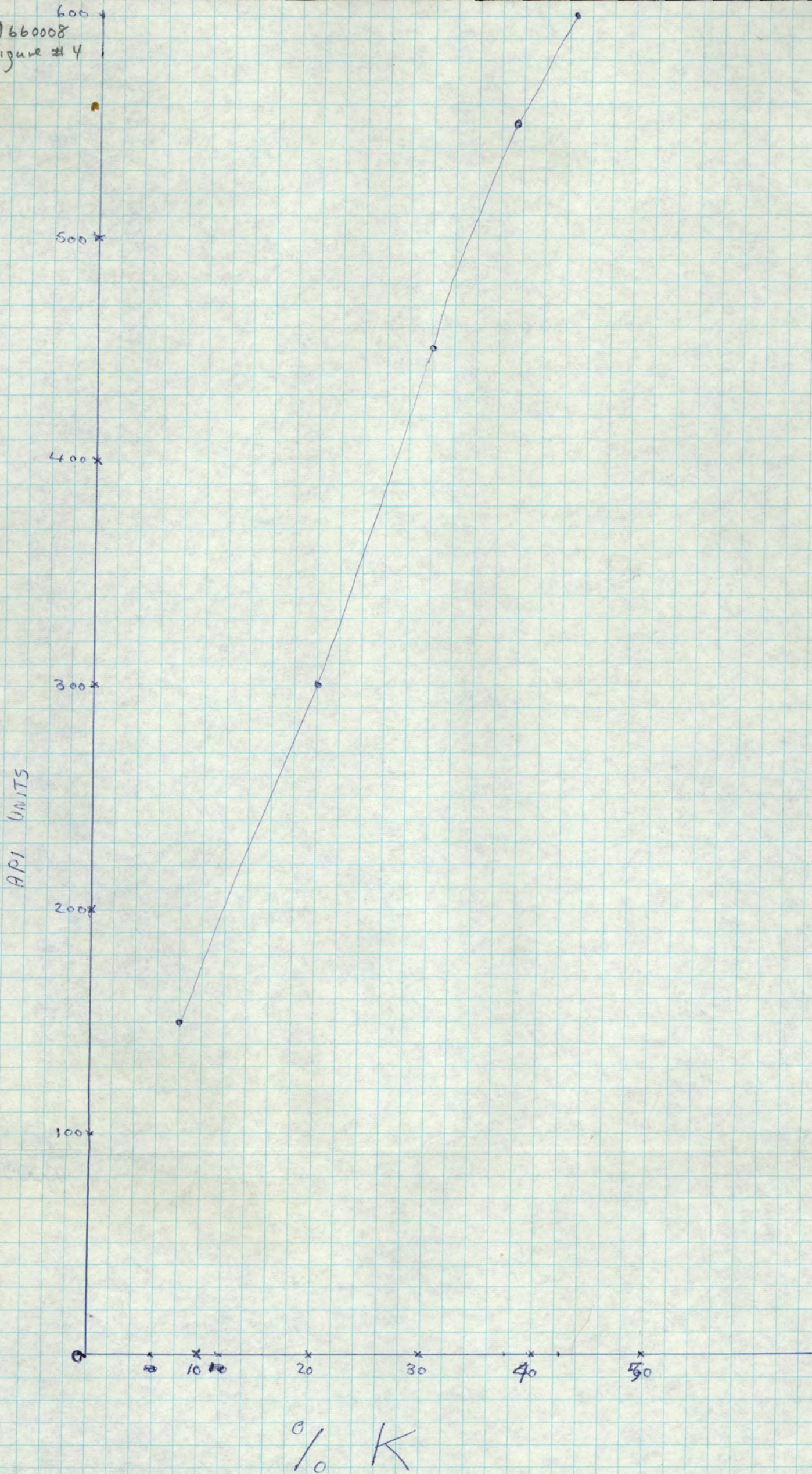
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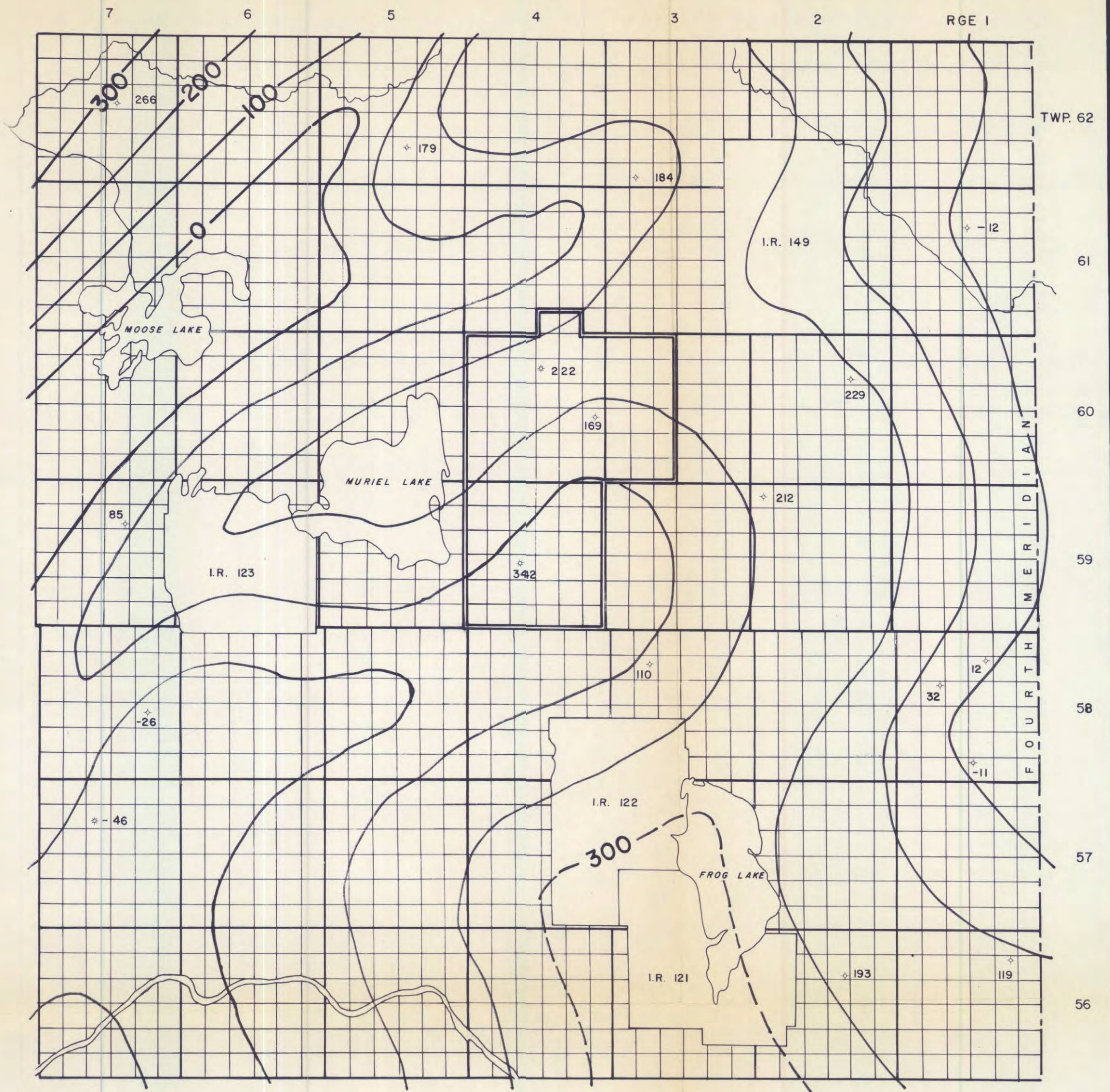
TP.61

TP.60

TP.59

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Figure # 4





Top Paleozoic Structure

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CANADIAN STRATIGRAPHIC SERVICE LTD.

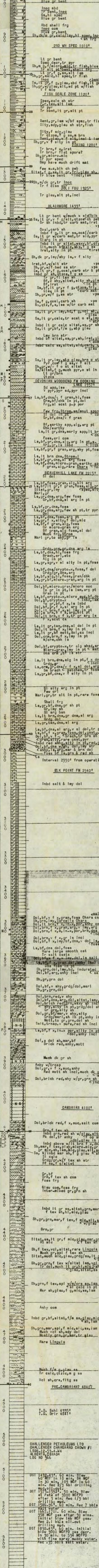
PROVINCE ALBERTA
 LSD: 8 SEC: 12 TWP: 53 RGE: 4 MER: W4
 COMPANY CHALLENGER PETROLEUMS LTD.

WELL CHALLENGER CHARGRAND CROWN #1
 AREA 4-VERMILION FIELD, WILLOCAT

PRODUCTION POTENTIAL GAS WELL
 LOG NO. 366 ELEV. 1970'
 T.D. 4841'
 COMM. July 21/51
 * COMPL. Aug 17/51
 E. LOG SCHLUMBERGER

REMARKS LITHOLOGY AND TOPS CHECKED AGAINST SCHLUMBERGER

SPUDS IN LEA PARK



CHALLENGER PETROLEUMS LTD
 CHALLENGER CHARGRAND CROWN #1
 LSD8-12-53-4-W4
 ALBERTA, CANADA
 LOG NO 366

24879

COUNTY ALBERTA
 FIELD or LOCATION WILDCAT
 WELL ERNESTINA LAKE 10-13

COMPANY CANADIAN SEABOARD OIL COMPANY
 COMPANY CANADIAN SEABOARD OIL COMPANY
 WELL ERNESTINA LAKE
 NO. 10-13
 LOCATION 10-13-60-4W4M

FIELD WILDCAT
 COUNTY ALBERTA
 STATE ALBERTA

Location of Well
 L3D. 10
 SEC. 13
 TWP. 60
 RGE. 4W4M
 GRN (ES LLM DM LT '77)
 Elevation: D.F. 1973
 or G.L.
 FILING No. 24829

Date RUN NO. ONE
 Date, Reference JUN 5, 1956
 Depth, Reference K.B.
 First Reading 4712
 Last Reading 0005
 Footage Measured 4207
 From Dipmeter 4719
 Maximum Temp. 98.1
 Mud Nature SALT

Density 11.3
 Viscosity 0.02 @ 72° F.
 Casing Size 8 10 3/4" to 603
 Open Hole 2
 Fluid Level (ft) FULL
 Fluid Level (ft) (GR) * 240 (N)
 Sensitivity log THREE * (N)
 Time Casedout C
 Brand, Size, Type 3/8" 1 1/2" 1 1/2" 1 1/2"
 Casing, Size, Type 3/8" 1 1/2" 1 1/2" 1 1/2"
 Cement, Type A
 Cement, Class A

13 JUN 56 JMC RD
 REMARKS GAMMA RAY SENSITIVITY TAP: T D TO 3950' - 200 A RILEY REPRODUCTION NEUTRON SENSITIVITY TAP: T D TO 4050' - 200 4050' - 200 4050' - 200
 3950' TO SURF - 100
 CALIBRATION: BACKGROUND CPS TEST SOURCE CPS GALV. INCREASE DIVS. PANEL SENS TAP FOR CAL
 GAMMA RAY: 10.4 407 100 407
 NEUTRON: 0 232 100 100

