MAR 19660006: WILDMERE

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WILDMERE POTASH PROSPECT

Report of Bayfield Oil & Gas Ltd.

19660006

REPORT

on

WILDMERE PROSPECT

Bayfield Oil & Gas Ltd.

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REPORT

on

WILLMORE PROSPECT

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WILDMERE PROSPECT

The location of the exploratory well in the Wildmere Prospect is such that one well will test both the hydrocarbons and potash possibilities of the area.

As a location for gas, the well will directly offset a Colony sand gas producing well by a mile, and as a potash location it will be within the immediate vicinity of a well that had indicated the presence of potash in the form of Carnallite.

The presence of a nearby pipeline and feasibility of an immediate gas sale further enhances the value of this prospect.

GEOLOGICAL SETTING

There have been sufficient wells drilled in this area to give a clear picture of the geological sequence to be expected.

THE VIKING SAND

The Viking sand is not developed in this area and offers a poor reservoir possibility.

THE MANVILLE GROUP

The Manville group is composed of a sequence of sand and shale. In this area it produces oil and/or gas. The oil is of heavy gravity and the gas devoid of sulphides. In the Wildmere gas field, the production is obtained from three different sands.

The Colony sand which is the first and uppermost sand is by far the most extensive. (See structure map). This is the sand that produces gas in Sec. 29, Twp. 48, 5 W4, and is expected to be productive in the proposed location.

The second, the Sparky sand, equivalent to the Wainwright sand, is found about 150 feet below the top of Manville. It is of smaller areal extent and produces in 2 or 3 wells in the vicinity of the test well.

The third and Lower sand unit which is possibly the Rex or the G.P. sand equivalent, is found about 300 feet below the top of Manville. This sand is developed more extensively than the Sparky. Structural configurations due to the underlying paleozoic topography affect the accumulation in this and the Colony sand more than the Sparky sand.

In the Manville group, beside the above three sands that are the major units in the area, numerous other sands still exist within the section where pinchout may cause possible accumulation of oil and/or gas. (See cross-section).

THE DEVONIAN SECTION

a) Upper Devonian

The lower Cretaceous section rests unconformably upon the Paleozoic Woodband sequence. The Woodband (Leduc equivalent), is about 450 feet thick and composed of grey to buff, vuggy dolomite. Due to lack of conditions suitable for hydrocarbon accumulations only salt water has been recovered from this interval.

The Cooking Lake underlying the above section is about 214 feet thick and is composed of argillaceous buff to grey, finely crystalline limestone. The Beaverhill Lake below it, about 710 to 790 feet thick, is composed of an alternating sequence buff argillaceous finely crystalline limestone with grey to green calcaceous shale. Both sections appear to have poor porosity and poor reservoir characteristics.

b) Middle Devonian

The Elk Point Evaporites equivalent to the Prairie Evaporites of Saskatchewan underlies the Beaverhill Lake formation and forms the uppermost

unit of the Middle Devonian sequence.

This section with its potential potash bearing possibilities is the primary objective horizon. In this area it is though to be about 422 feet thick, the upper 250 to 300 feet of which is potash bearing.

The V.C.O. #15 and the projected exploratory drilling are located in the eastern flank of the Elk Point Synclinal Evaporitic Basin (Figure 3) and are thus in similar position with respect to the basin as Unity, Saskatoon and Esterhazy. However from depositional standpoint the locations are found to be north of the restriction formed by the Meado Lake Escarpment (Figures 3 and 5). This Alberta evaporitic sub-basin is an untapped (Figure 4) potential basin. The restriction may have been instrumental in preventing flow of fresh brine into the Saskatchewan Sub-basin, thus creating proper environment for the precipitation of potassium, but there is nothing to suggest that similar conditions did not exist in Alberta, due either to the effect of the Chipewyan Lake sill (Figure 3) and other local conditions such as salt bars that may have permitted complete evaporation of the brine and deposition of Potassium. In fact the presence of carnallite and/or Sylvite in the V.C.O. #15 well (6 - 12 - 49 - 6 W4) is a direct indication that conditions necessary for the precipitation of Potash have prevailed in this area.

The Summary of Potassium occurences in the V.C.O. #15 well can be outlined as follows -

Interval	Thickness	Lithology
		Potassium and Salt
3480 - 3531	51'	Salt with slight indications of Potassium
3531 - 3621	90'	Not cored
3621 - 3731	110'	Potassium and Salt
3731 - 3806	75'	Salt, Shale and Dolomite
3806 - 3903	97'	
Total	423'	
Below 3903		Dolomite and Shale

The top of the formation is thought to be at 3480 feet and the Potassium minerals were reported to occur between 3480 and 3531 feet drilling depth. Further occurences were reported to exist between 3731 and 3806 feet. The interval between 3621 and 3731 feet was not cored, consequently we do not know if there was any indication of Potassium. Therefore within the upper 326 feet of the Prairie Evaporites, at least a total of 126 feet showed Potassium mineralization. Furthermore, the samples were analyzed qualitatively in terms of mineralogic compounds but not quantitatively. Consequently, the well may possibly have indicated an economic Potassium deposit whose full significance was probably destroyed through not only poor handling of the cores but also through inadequate analysis and drilling practice.

The sequence of Potassium occurence in this well very closely reflects the setting of Potassium beds found in Saskatchewan. (Figure 6).

Potash has not been explored in Alberta as it has been in Saskatchewan. Very few wells in this area have drilled to sufficient depth to assess the salt section. Of these deep wells, the Vermilion Consolidated #15 well, drilled in 1944, penetrated the Prairie Evaporites and indicated the presence of Carnallite and possibly Sylvite. The extent and the economic potential of this Potash section may be either wholly or partly answered by the contemplated Potash test in Lsd 6 - 32 - 48 - 5 W4. This well, located about 2 miles southeast of the V.C.O. #15 well is not a rank wildcat but will be a follow-up or a direct offset to this earlier Potash occurence whose full economic significance as mentioned previously has not been properly ascertained. Consequently, the proposed well may easily open new vistas for Potash Exploration in Alberta.

Below the salt section lies the Elk Point carbonate, composed of 242 feet of cream to tan dolomite. The unit is equivalent to the Winnipegosis of Saskatchewan and to the Keg River formation of Northwest Alberta. In this area the Keg River appears to be within the fringing carbonate bank of the Elk

Point Basin. However, since the location is near the eastern margin of the bank, it may be reasonable to expect a possible patch reef development. If reef is encountered it may well be equivalent to Rainbow Lake discoveries.

Therefore from the hydrocarbon standpoint, the location has two potential horizons to investigate, the sands of the Manville group and possible reefing in the Elk Point.

STRUCTURAL SETTING

The structure map drawn on top of the Manville and/or Colony sand shows topographic highs flanked by narrow errosional consequent drainage channels. The channels and the highs run in a Northeast Southwest direction. Since the accumulation in most pools is due to a combination of structural and stratigraphic conditions, the interpretation of this pattern has a direct bearing in oil and gas exploration in the area. The pools are primarily located on highs. The proposed well is thus located on a possible high which directly offsets the gas production found in Section 29 by 1 mile. (See structure map and cross section).

LAND POSITION

Bayfield has, as shown in the attached land map, Potash Permit # 2. About 30,000 acres will be parcelled out against the proposed location. In addition to the potash rights, Bayfield has obtained through farmout from Union Oil Co. of Canada Ltd., Petroleum and Natural Gas rights in two blocks of land.

FARMOUT LANDS

U-1 - Twp 48, Rge 5, W4, Sec. 32 and 33
- T wp 49, Rge 5, W4, Sec 5

About 1920 acres, subject to an Overriding Royalty payable on crude

petroleum of 1/200th of monthly production expressed as a percentage with a minimum of 7½% and a maximum of 15% and an Overriding Royalty payable on natural gas of 15% of the market value received. Furthermore Union shall retain the option for a period of 60 days following completion of the test well on the farmout lands, the right to convert it's G.O.R.R. Interest to an undivided 50% W.I. on all lands except the spacing unit upon which the described test is located.

U-2 - The drilling, completion and/or abandonment of the test well shall earn Bayfield the option for a period of 45 days, following rig release of the test well the right to drill and earn on the same terms and conditions as outlined above the following 2,560 acres of land

Twp. 49, Rge. 5, W4 - Sections 6, 7, 9 and 18.

With the farmout agreement Bayfield of course undertakes to pay all rentals while the agreement is in force with Union.

Two more sections may be added to the P and N.G. land picture. They will be Section 31 in Twp. 48, Rge. 5, W4 and Section 4 in Twp. 49, Rge. 5, W4. Negotiations are underway for these two sections only for the P & N.G., since Bayfield owns already the Potash rights.

WELL PROGNOSIS

Location: 6 - 32 - 48 - 5 W4M.

Objective Horizons: Manville Group
Elk Point Potash and Reef

Deepest Formation to be penetrated: 50 feet into the Elk Point Carbonate (Reef)

Drilling Depth: 4133 feet

Elevations: K.B.: 2150 (est.)
Ground: 2138 (est.)

Assuming a K.B. elevation of 2150 feet the following formations are predicted to occur as follows:

Formations	Sub-Sea Depth	Drilling Depth
2nd White Specks	+ 646	1504
Viking	+ 500	1650
Manville-Colony	+ 350	1800
Sparky	+ 210	1940
Lower Sand	+ 70	2080
Woodband	- 62	2212
Cooking Lake	- 510	2660
Beaverhill Lake	- 724	2874
Elk Point Evaporites	- 1511	3661
Elk Point Carbonate	- 1933	4083
T.D.	- 1983	4133

WELL COSTS

The estimated cost of the well is outlined below:

To Casing Point:

Drilling	$ 21,000
Survey and Licence	200
Location Access Roads	500
Surface Casing - bowl. and service	2,800
Logs, Elog and gamma - sonic	1,700
DST, two	1,400
Coring - 200' +	1,500
Daywork for log, test and core	2,700
Mud and Additives	5,000
Supervision	1,000
	$ 37,800
Contingencies 5%	1,890
TOTAL TO CASING POINT	$ 39,690

To Abandonment:

Plug and Abandonment	$ 1,100
Location clean-up	300
TOTAL TO ABANDONMENT	$ 41,090

COMPLETION COST

The completion cost will depend on whether or not the well is cased during drilling or afterwards. The following cost assumes that the well will be cased after drilling the well:

Casing to 2200' - 4½"	$ 3,190
Cement and casing accessories	1,000
Perforations	1,500
Acid Wash	500
Well head and assembly	1,000
Tubing 2200 - 2"	1,800
Service Rig	1,000
Supervision	300
Total	$ 10,290
Contingencies 5%	500
TOTAL	$ 10,790

SURFACE EQUIPMENTS

a) Oil Well

Complete Tank and Battery	$ 5,000

b) Gas Well

Separator and Assembly	$ 3,000

TOTAL COST FOR A MANVILLE SAND GAS WELL

Drilling	$ 39,690
Completion	9,790
Surface Equipment	3,000
Total	$ 52,480 *

* If a dehydrator is needed an additional $8,000 will be added to above sum.

TOTAL COST FOR A MANVILLE OIL WELL

Drilling	$ 39,690
Completion	9,790
Pump, Pump Jack, Pump Rod String and motor and base	4,000
Battery	5,000
Total	$ 58,480

If production is obtained from the Elk Point, the completion cost will of course be higher because of the longer string of casing and tubing required.

TERMS

Considering the completion complexity involved with the well and

the different cost applicable to each case, Bayfield proposes the following terms to persons or groups willing to participate in this venture:

Based on the cost and program as outlined under the heading of "Estimated cost of the well to casing point" which is about $40,000, each unit or fraction thereof will earn 25% working interest for $15,000. The earned interest will apply to over 1900 cres of hydrocarbons as well as 30,000 acres of Potash.

If lost circulation is encountered the additional cost of mud and other extra cost incurred from changes in the drilling and completion procedure from that outlined above will be borne by all participants in direct proportion to their working interest ownership in the well. Such changes to be agreed by the majority of the working interest owners.

RESERVES

a) Manville Gas

Pay: 20'

Spacing: 640 acres (Possibly 1280 acres)

Recoverable gas: 200 Mcf. per acre ft.

Recoverable gas Reserve: 20 x 640 x 200 = 2,560,000 Mcf.

Value @ 10 cents/Mcf: 2,560,000 x .10 = $256,000

Net Value @ 7 cents/Mcf: 2,560,000 x .07 = $179,200

b) Manville Oil

Pay: 10'

Spacing: 80 acres

Recoverable Oil: 400 bbls./acre ft.

Reserves: 10 x 80 x 400 = 320,000 barrels.

Net Value: 320,000 x 1.04 = $342,800

ECONOMICS

Gas - Manville

a) Under the normal daily production, the pay-out on this well will be as follows:

Daily Deliverability: 1.0 MMcf.

Net Value: 1,000 x .70 = $70

Monthly Revenue: $70 x 30 = $2,100

Pay-out: $\frac{52,480}{2100}$ is about 25 months or 2 years and 1 month.

b) Under restricted conditions and peak load production the pay-out will be as follows:

Estimated Average monthly production: 4,000 Mcf.

Price: 10 cents/Mcf.

Net Price: 7.0 cents/Mcf.

Value of Gas: 4,000 x .70 = $280

Payout: 16 years

This long pay-out period is due to the fact that the well is more expensive being a Potash test, and that the gas production is restricted to peak load demand.

OIL

a) Manville Group

Daily Production: 25 bbls/day.

Price: $1.72

Less:	G.O.R.R. 16% -	$ .28
	Trucking -	.20 (est.)
	Operating -	.20
	Total	$ .68

Net Price: $1.72 - 0.68 = $1.04

Daily Returns: 25 x 1.04 = $26.00

Payout: $\frac{60,000}{26}$ = 2300 days or $8\frac{3}{4}$ years.

b) Elk Point Carbonate - Oil Well

Daily Production: 35 bbls/day

Price: $2.60

Less:	G.O.R.R.	$ .59
	Trucking	.20
	Operating	.20
	Total	$ .99

Net Price: $2.60 - 0.99 = $1.61

Daily Returns: 35 x 1.61 = $56.40

Payout: $ $\frac{64,000}{56.4}$ = 1135 days or 3 years

POTASH

The Potash of course will be the most rewarding find. The prices of Potassium is as follows:

Bulk, carload, works, unit ton: $0.32

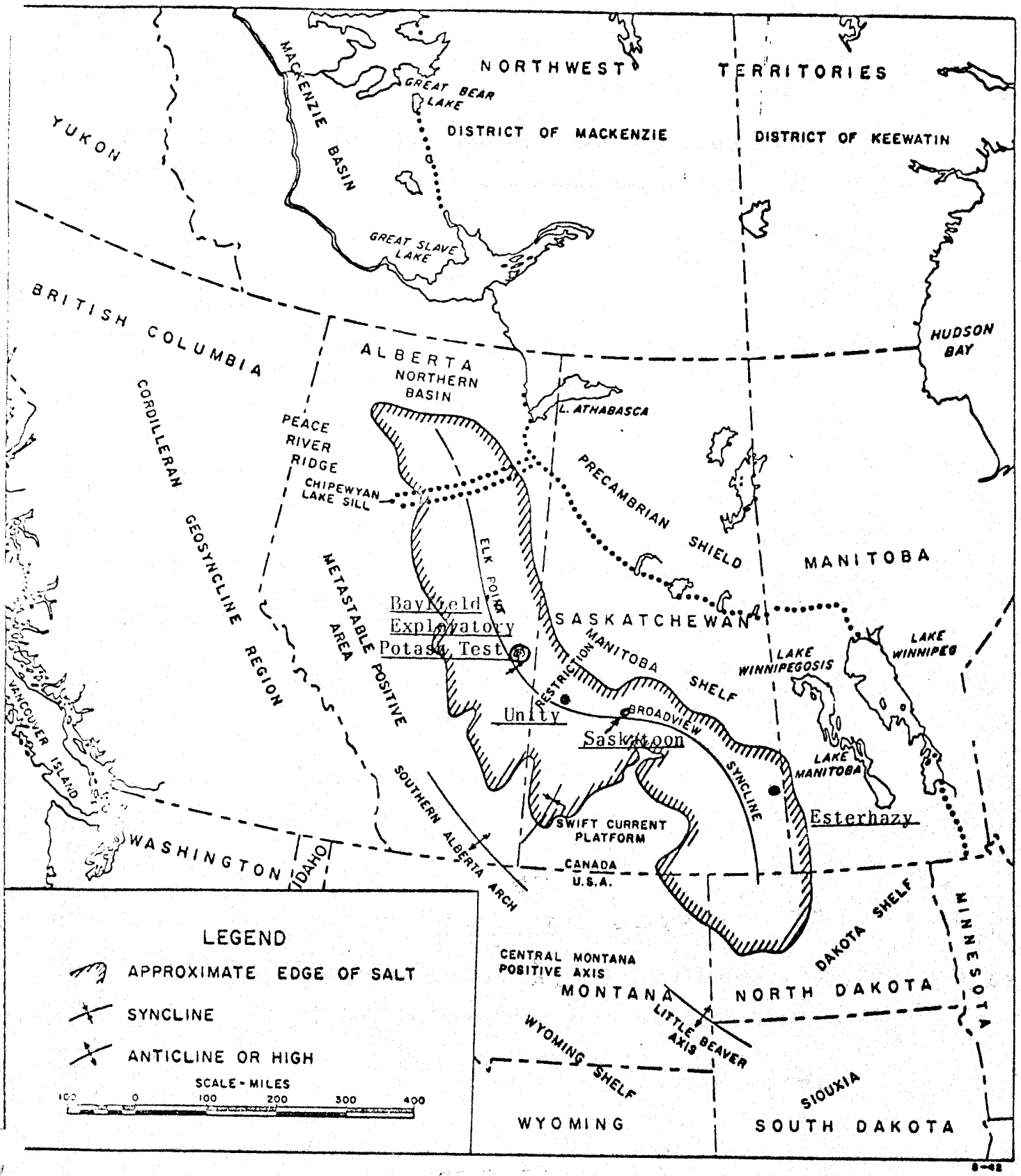
Bagged, 60% min. K_2O same basis, ton @ $0.40/unit = $24.00

The commercial grade of the ore which is being extracted by conventional mining methods is in the 25 to 32 per cent K_2O range. The grade of ore to be extracted by solution mining methods may be somewhat less.

On bulk ore averaging 25% K_2O content the price will be $7.50 per ton. About a 3 to 1 concentration will bring the price to 40 cents per unit per ton or to a value of $24.00 for 60% minimum K_2O content.

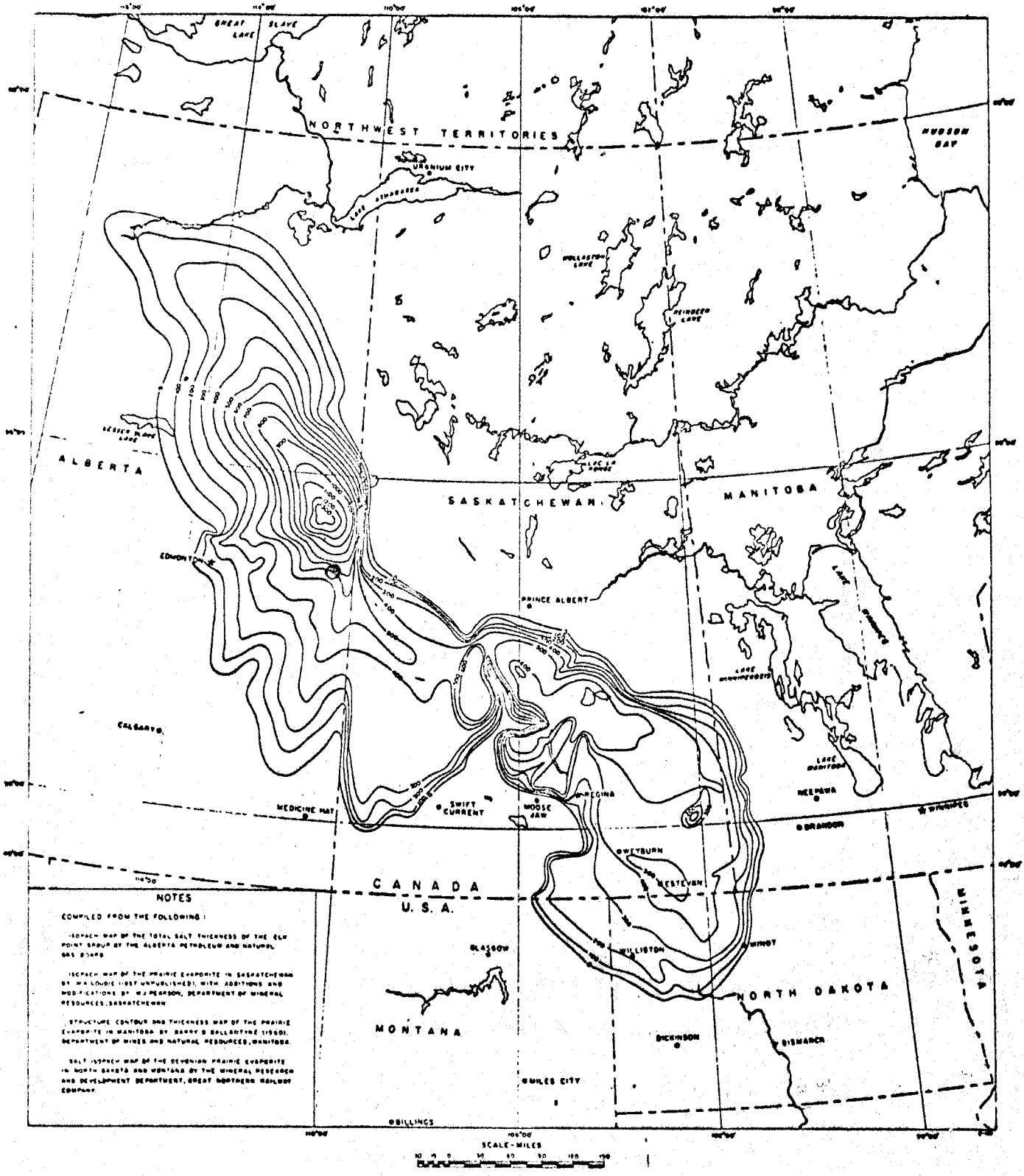
Based on a 1,000,000 ton/year mill operation the pay-out on $47,000,000 expenditure for shaft plant and surface installations is about 2 years or a maximum of 3 years considering other possible expenses.

The reserves in the farmout lands can be expected to be upward of 100,000,000 tons and the returns on Potash are unquestionably rewarding when one considers that the pay-out even on heavy investments is relatively low. The life of a mine can be expected to be no less than 20 years and the demand for Potash is increasing by the year.



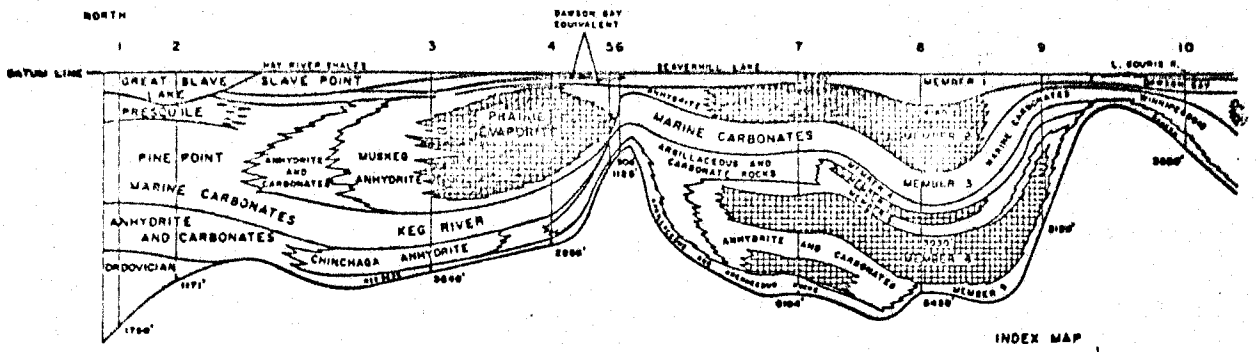
THE ELK POINT SALT BASIN AND RELATED TECTONIC ELEMENTS

Figure 3



ISOPACH MAP SHOWING THE TOTAL THICKNESS OF THE SALT IN THE ELK POINT GROUP.

Figure 4



INDEX MAP

Chipewyan Lake Sill

Restriction, Meadow Lake Escarpment

WELL NAMES AND LOCATIONS

1 N.W.T. WINDY POINT No.1
NORTHWEST TERRITORIES

2 COMINCO B-1
NORTHWEST TERRITORIES

3 H.B. FORT VERMILION No.1
15 - 32 - 104 - 8 - W5

4 BEAR SILTMORE No.1
7 - 11 - 87 - 17 - W4

5 BEAR RODEO No.1
LOT 8 McMURRAY 89 - 9 - W4

6 BEAR WESTMOUNT No.2
9 - 36 - 88 - 6 - W4

7 IMPERIAL BROSMONT No.1
13 - 17 - 67 - 23 - W4

8 IMPERIAL PLAIN LAKE No.1
1 - 11 - 63 - 12 - W4

9 IMPERIAL GOODSOIL
8 - 11 - 62 - 22 - W3

10 ALBERCAN CROWN
13 - 32 - 48 - 11 - W3

11 MIDAS No.3
14 - 28 - 36 - 8 - W3

12 FORTUNE No. A8 - 14
8 - 14 - 28 - 14 - W3

13 T.W. EASTEND CROWN No.1
18 - 11 - 8 - 20 - W3

14 SHELL BARCLAY SUPREME No.1
1 - 21 - 2 - 26 - W3

LEGEND

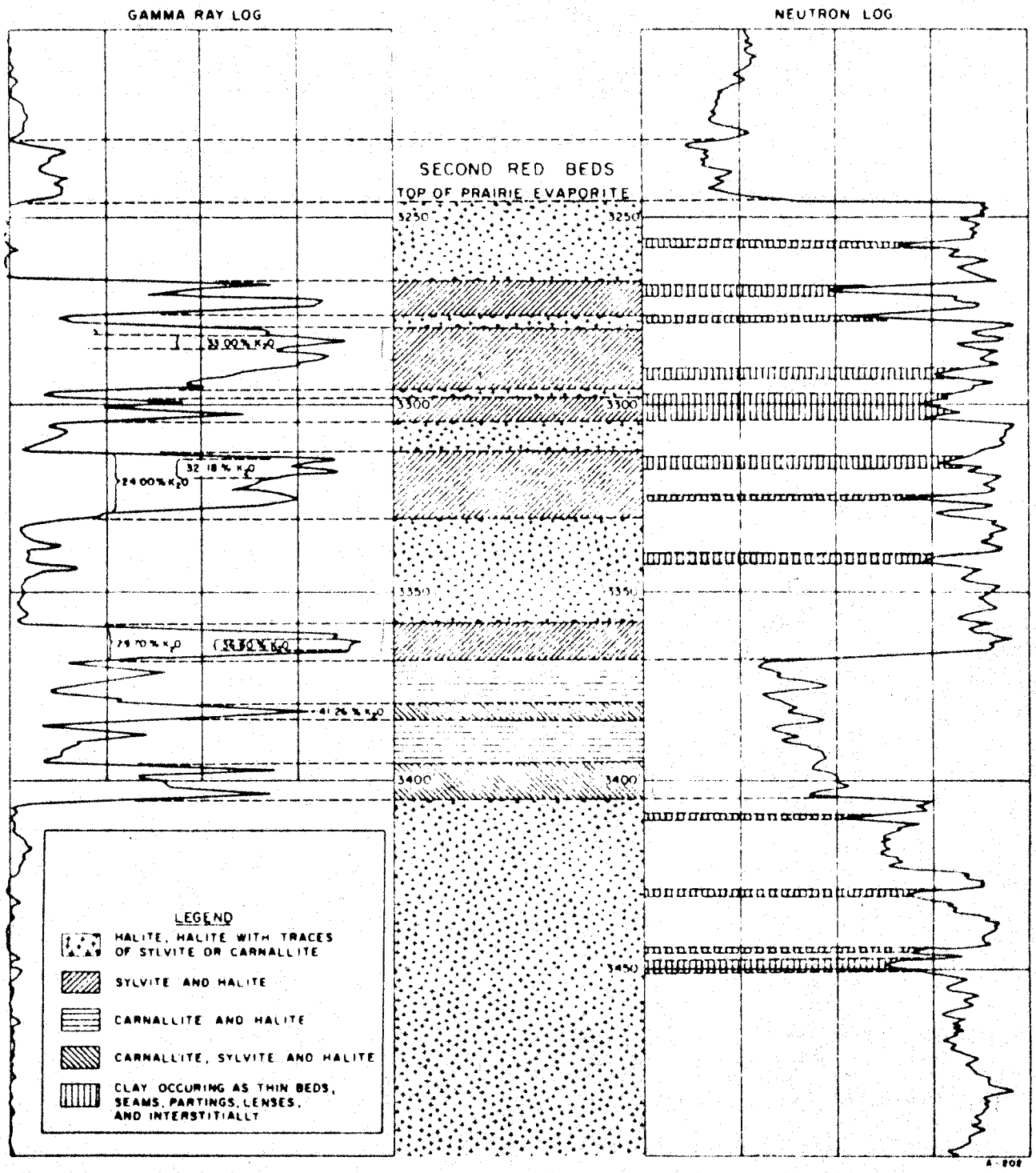
POTASH SALTS

ROCK SALT

VERTICAL SCALE IN FEET

FACIES AND STRUCTURAL CROSS - SECTIONS
OF
MIDDLE DEVONIAN FORMATIONS IN THE ELK POINT BASIN
IN
ALBERTA AND WESTERN SASKATCHEWAN
(AFTER GOVETT, 1961, MODIFIED)

Figure 5



CORRELATION OF GAMMA RAY AND NEUTRON LOGS
WITH THE MINERALOGY AND LITHOLOGY OF THE UPPER PART OF THE PRAIRIE EVAPORITE
AND OVERLYING SECOND RED BEDS

Figure 6

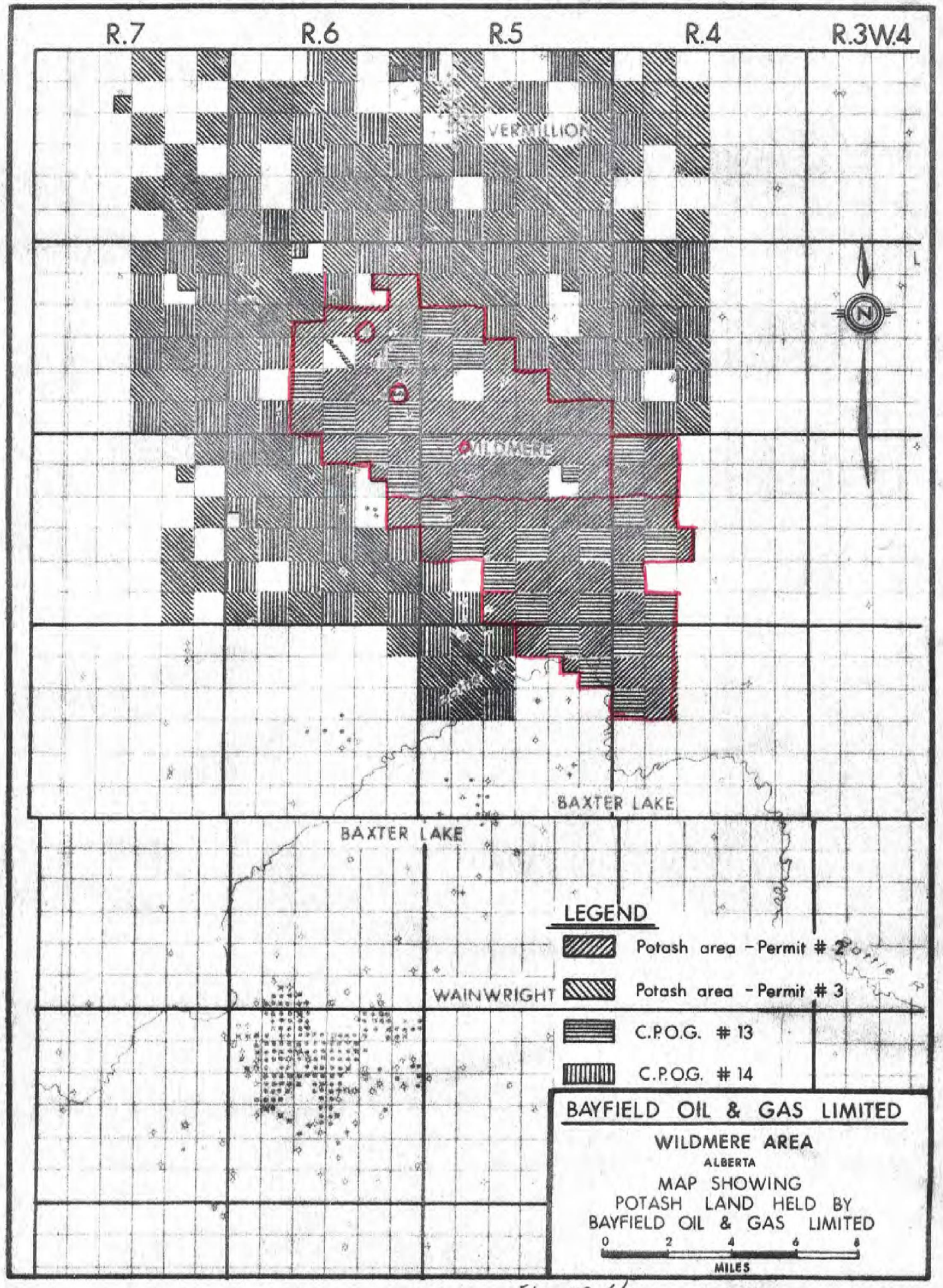
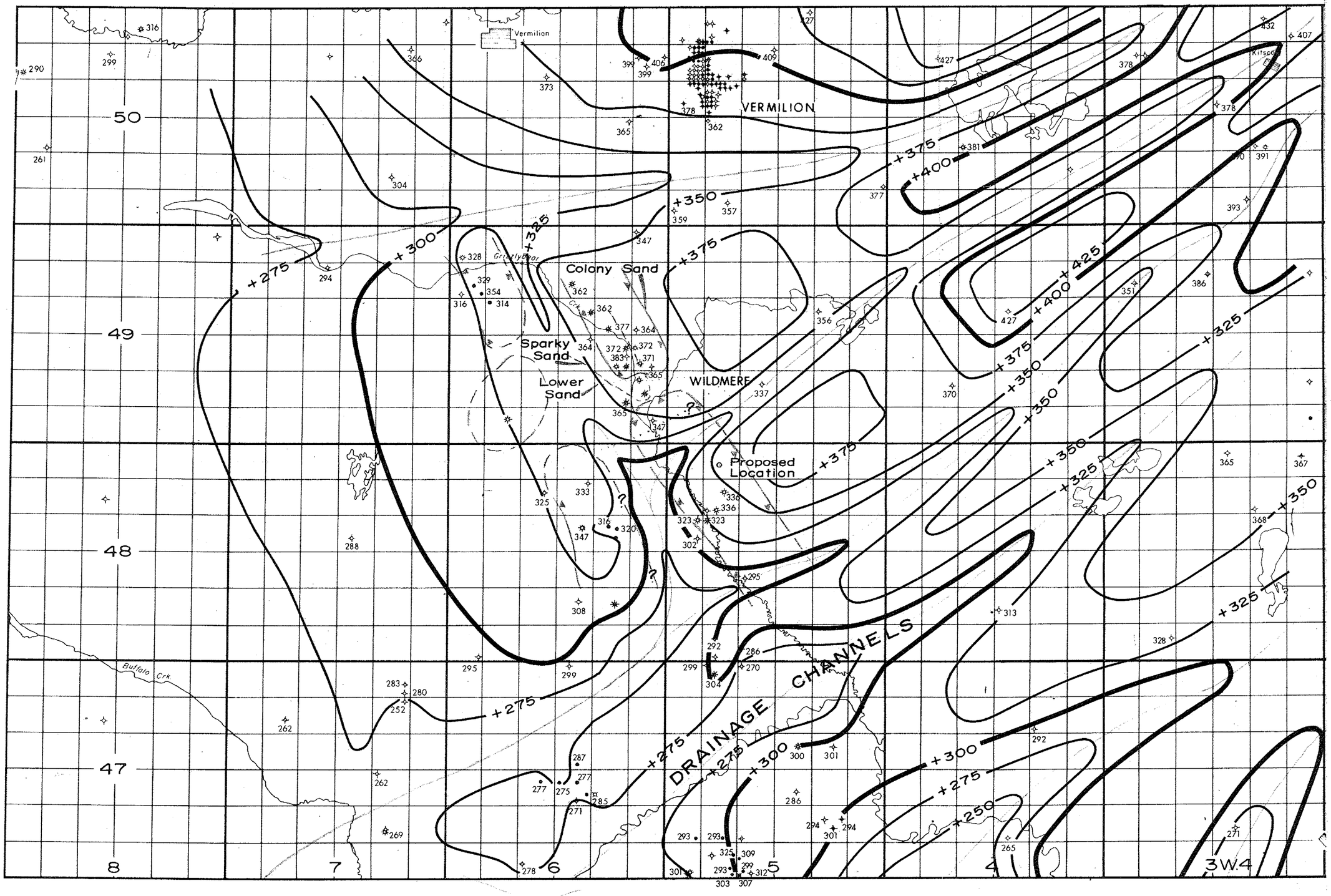

R.7
R.6
R.5
R.4
R.3W.4
T. 50
T. 49
T. 48
T. 47
T. 46
T. 45
VERMILLION
WILDMERE
BAXTER LAKE
BAXTER LAKE
WAINWRIGHT
N
LEGEND
Potash area - Permit # 2
Potash area - Permit # 3
C.P.O.G. # 13
C.P.O.G. # 14
BAYFIELD OIL & GAS LIMITED
WILDMERE AREA
ALBERTA
MAP SHOWING
POTASH LAND HELD BY
BAYFIELD OIL & GAS LIMITED
0 2 4 6 8
MILES

Figure 4



LEGEND

— — COLONY SAND

– – – – SPARKY SAND

····· LOWER SAND (REX ?)

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WILDMERE AREA

STRUCTURE TOP OF MANVILLE

CONTOUR INTERVAL: 25' SCALE: 1" = 2 MILES

Figure 1 1966 0006

A

B

NORTHWEST

SOUTHEAST

PROPOSED LOCATION 6-32-48-5

DATUM – S.L. + 700'

UPPER CRETACEOUS

LOWER CRETACEOUS

BASE FISH SCALE

COLONY SAND

SPARKY SAND EQUIV.

MANVILLE GROUP

LOWER SAND (REX ?)

UPPER DEVONIAN WOODBEND (LEDUC EQUIV.)

✲ PRODUCING GAS ZONE

✲ POSSIBLE GAS ZONE

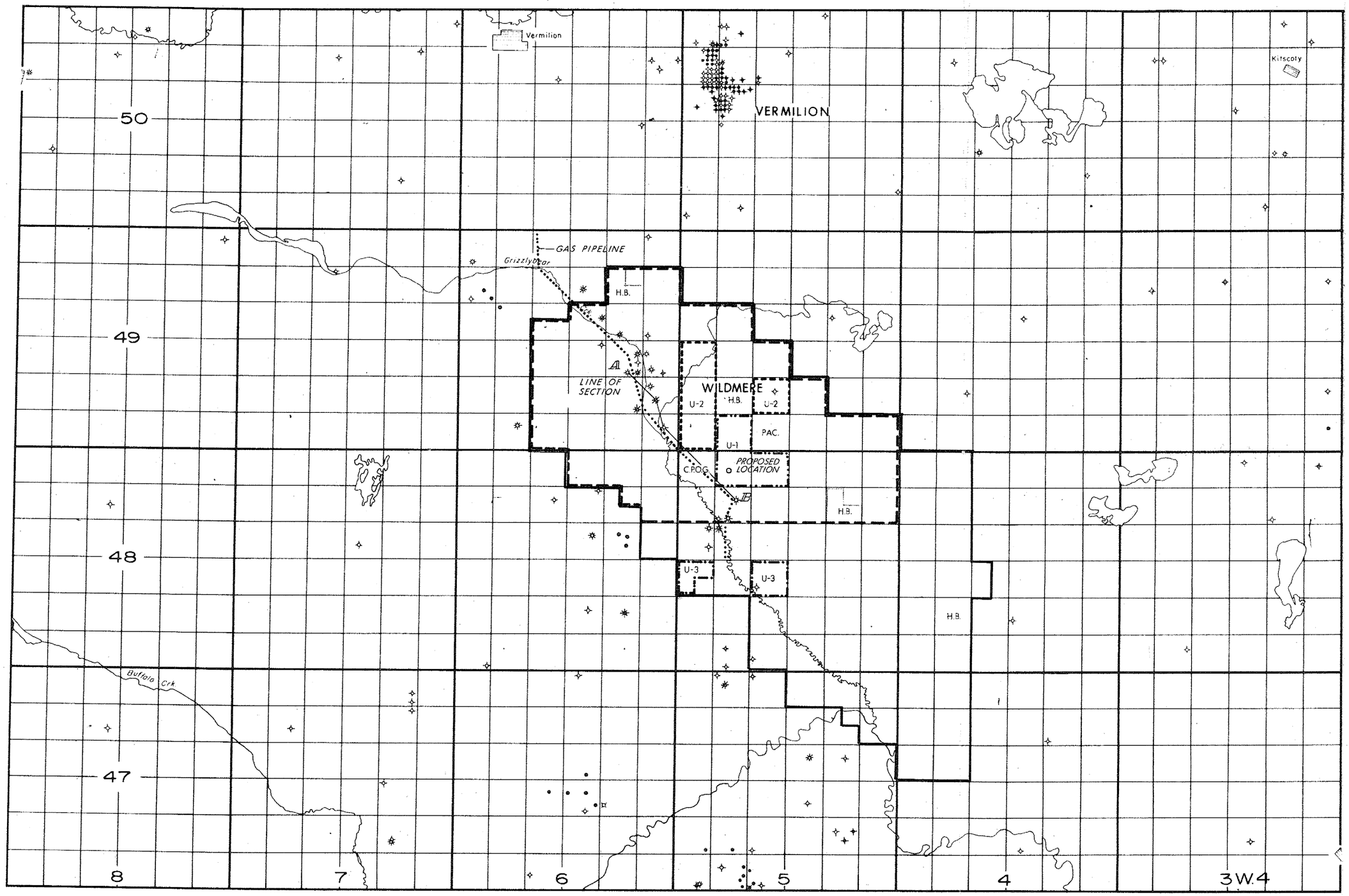
BAYFIELD OIL & GAS LTD.

WILDMERE AREA

STRUCTURAL CROSS SECTION A—B

HORIZONTAL SCALE: 5" = 1 MILE.
VERTICAL SCALE: 1" = 100 FEET.

1966005 Figure 2



LEGEND

- POTASH AREA – PERMIT 2
- EARNED POTASH AREA
- U-1 P.&N.G. LEASE
- U-2 P.&N.G. LEASE
- U-3 P.&N.G. LEASE

BAYFIELD OIL & GAS LTD.

WILDMERE AREA

LAND MAP

SCALE: 1" = 2 MILES

19660006 - Figure 7