GEOLOGICAL REPORT

ON

NORTHWEST TERRITORIES PERMITS

975, 976, 977, 978, 979 &

980.

KAKISA RIVER AREA

BY

W. I. Wright,

and

J. Harrison.

Calgary, Alberta.
October, 1957.

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INTRODUCTION

This report presents the results of a geological investigation of Northwest Territories Permits No. 975 - 980 and adjacent areas of interest. The field work upon which the report is based was carried out by Mobil's Geological Party No. 33 between May 23 and June 1, 1957 as part of a large mapping program in the Northwest Territories. The party consisted of three geologists, a helicopter pilot and mechanic.

The party left Calgary, Alberta on May 23, 1957 by Mobil's Beaver aircraft and flew to Hay River, Northwest Territories. From this point a Norseman aircraft, equipped with floats, was chartered from Pacific Western Airlines and the party and equipment was flown to Bistcho Lake at the extreme northwestern part of Alberta. A Bell D2 helicopter, chartered from Associated Helicopters Ltd., Edmonton, was flown to the area and used to transport the men during the field work. Gasoline and oil for the helicopter and aircraft was transported to Bistcho Lake by tractor train during the winter frozen period of 1957.

The object of the survey was to study the stratigraphy and structural geology of the area for the purpose of obtaining information on potential oil bearing structures. In addition, Pleistocene and Recent geology, such as the nature and thickness of the superficial deposits were studied for reason of their importance to geological surveys and drilling programs. Notes were also made on the topography and vegetation

insofar as these features would effect future operations in the area.

The air photographs used in this evaluation were obtained from the Royal Canadian Air Force. The quality of the photographs is generally good. Scale control for the map which accompanies this report was afforded by identification on the air photographs of geographic features of published topographic maps of the area. All information derived from the survey was transferred to the map accompanying this report.

LOCATION AND ACCESSIBILITY

Permit areas 975 - 980 are located on National topographic map sheet No. 85 S.W. They are located with 60° 00' and 60° 20' north latitude and 119° 15' and 120° 00' west longitude. They contain a total of 378,076 acres. The following is a detailed description of the locations of the permits:-

Permit 975:- 60° 00' - 60° 10' N. Lat.
119° 45' - 120° 00' W. Long.
63,854 acres.

Permit 976:- 60° 00' - 60° 10' N. Lat.
119° 30' - 119° 45' W. Long.
63,854 acres.

Permit 977:- 60° 00' - 60° 10' N. Lat.
119° 15' - 119° 30' W. Long.
61,800 acres.

Permit 978:- 60° 10' - 60° 20' N. Lat.
119° 45' - 120° 00' W. Long.
63,534 acres.

Permit 979:- 60° 10' - 60° 20' N. Lat.
119° 30' - 119° 45' W. Long.
63,534 acres.

Permit 980:- 60° 10' - 60° 20' N. Lat.
119° 15' - 119° 30' W. Long.
61,500 acres.

The permit areas are very inaccessible by ground transportation in that they are located approximately 80 miles from the nearest all weather road, the Mackenzie Highway. Bush trails and the N.W.T. Alberta boundary survey have been opened up westward from this road and these have been used for exploration work in the general area of the permits for winter seismic work and wildcat drilling.

Within the permits proper there are no bulldozed roads or lines. However, approximately two and one half miles east of the eastern border of Permits Nos. 977 and 980 there is a winter seismic line trending north-south. This line was followed from near the western end of Bistcho Lake, Alberta, northward for a distance of 40 miles.

TOPOGRAPHY AND DRAINAGE

The permit areas are located in the northern interior plains physiographic province which, in general, is characterized by muskeg, small lakes and numerous small meandering streams. Within the permits, however, three distinct variations in the land forms were noted. These are as follows:

1) In permit area 977, especially the southeast part, the topography consists of numerous very irregular shaped lakes between low, rounded hills; forming knob-and-kettle topography. This area is poorly drained, has small scrubby trees, and should require the minimum of bulldozing in making seismic winter trails.

2) Along both sides of the west fork of the Kakisa River there are numerous large groves trending N. 30° E. These are of glacial origin. These are about 20 - 30 feet deep and some of them extend for several miles. These groves have an influence on the courses of the numerous tributaries of the Kakisa River in that when the tributary enters the area of the grooves, its course swings abruptly and tends to follow the groove until it joins the Kakisa River. As mentioned above the grooves are of glacial origin and, therefore, not connected with the structure of the underlying beds. They will, however, offer an obstacle when crossing with roads, especially when travelling across the trend of the grooves.

3) In the inter stream in the northern portion of the area, and especially in the northwest part, there are numerous low short ridges trending in a north-west direction. These ridges are usually forest

covered with trees somewhat larger than in the surrounding wet country. The ridges are of glacial origin and control to a large extent in the courses of the tributary streams entering the Kakisa River drainage. The ridges probably represent deposits dumped into crevasses when the last ice sheet melted.

The permit areas are drained by two main drainage systems. The first on the west side of the permit drains northeastward as part of the Kakisa River system which joins the Mackenzie. The second, on the eastern part of the permits, drains to the south and west into the Petitot River which, in turn, joins the Liard River.

GEOLOGY

STRATIGRAPHY

The entire area of the subject permits is covered with a variable thickness of glacial drift, with no bedrock exposed. To the east, on the Cameron Hills, bedrock of Lower Cretaceous shale was found in a stream draining these hills and it is believed the same strata are present beneath the drift on permit areas 975-980.

To the north of the subject permit areas, on the Kakisa River and other streams draining into the Mackenzie River, the Lower Cretaceous shales rest upon the eroded Upper Devonian surface and the early Mesozoic and late Paleozoic sediments are absent from the stratigraphic section. To the west and south of the permits drilling

has encountered Mississippian and further to the southwest Triassic and Jurassic are found beneath the Lower Cretaceous.

Recent wildcat wells in adjacent areas in the Northwest Territories, British Columbia and Alberta have made it possible to predict, with a fair degree of accuracy, the thickness and lithology of the buried formation in the area. Based on this wildcat well information, a stratigraphic columnar section has been prepared for permit areas 975 - 980. The major units within this section are described briefly below:

Silurian

Red Beds and Chinchaga formations

About 500 feet of Silurian strata are exposed on Nahanni Butte to the west - northwest of the subject permits. These strata consist of silicous limestone and dolomite alternating in dark and light coloured beds about three feet thick. Most of the rock is fine grained, hard and dense, and has been indurated by siliceous and calcareous solutions.

To the northeast of the map area, in the Great Slave Lake region, wells have penetrated about 800 feet of beds believed to be of Silurian age. The base part of this section is known as the Red Beds and consist of red calcareous shale, sale and gypsum. The overlying beds about 500 feet thick are made up of dolomite and anhydrite.

In the wells drilled near the subject permits a somewhat similar section to that found in the Great Slave Lake area has been encountered. This Silurian section has been broken down into the Red Beds at the base overlain by a sequence of anhydrite and

dolomite referred to as the Chinchaga formation.

Middle Devonian

Muskeg - Keg River Formation

The Muskeg - Keg River formation varies considerably in lithology throughout Alberta, British Columbia and the Northwest Territories. In the nearest deep test studied, Shell Sun North Petitot River 4-22 (Lsd. 2, Sec. 22, Twp. 125, Rge. 11, W6M) this formation consists almost entirely of limestone and dolomite. To the southeast of this location the Muskeg formation is made up of dolomite and limestone with considerable amounts of anhydrite and far to the southeast, the amount of anhydrite increases with dolomite and limestone present in subsidiary amounts.

In the permit areas under consideration the Muskeg - Keg River interval is expected to be approximately 800 feet thick and to be composed largely of dolomite and limestone.

Slave Point Formation

The Slave Point formation has a wide distribution in Northern Alberta, British Columbia and the Northwest Territories. It was first described by Cameron of the Canadian Geological Survey (1922) where exposed on Great Slave Lake. Within the general area of the subject permits this formation has an average thickness of 200 feet and consists almost entirely of limestone, in some cases a few feet of anhydrite and dolomite near the base. The limestone is brown, light brown, and light yellowish grey and microfragmental.

The contact with the Slave Point limestone with the overlying Upper Devonian Hay River shales is sharp and probably conformable.

Upper Devonian

Hay River Shale

The type section of the Hay River shale is exposed on the Hay River about 90 miles to the northeast of the report area. Also it has been encountered in all deep test wells in nearby areas. In the subject report area the Hay River shale is expected to be about 1700 feet thick. The basal part is believed to be made up of greenish grey shale with a few interbeds of limestone. In some wells the extreme basal part of this greenish grey shale is interbedded with dark grey non-calcareous shale with small carbonaceous flecks and bituminous in places.

The main part of the Hay River shale consists of greenish grey calcareous shale and siltstone. Bands of silty limestone and calcareous siltstone are present and become more abundant in the upper few hundred feet approaching the Hay River limestone.

The basal part of the Hay River shale has been correlated with the upper part of the Beaverhill Lake formation of Central Alberta. The main part of the formation is equivalent in age to the Woodbend formation and the extreme upper part may be of the same age as Winterburn formation of central Alberta.

Upper Devonian

Hay River Limestone formation

The type section of the Hay River limestone is along the Hay River. Other excellent exposures of this formation occur along

the northward facing escarpment west of Hay River and where the northward draining streams cut through this escarpment and flow into the Mackenzie River. In the subject permit areas the Hay River limestone is expected to be about 1400 feet thick. These strata where examined in the field, and in deep test wells consist of yellowish grey to pale yellowish brown microfragmental, cryptocrystalline, microcrystalline and chalky limestone. Dolomite crystals occur locally in the limestone and there are some dark brown argillaceous partings. On faunal evidence there is some evidence to correlate the Hay River limestone with part of the Winterburn formation of the Central Alberta area.

Mississippian

Banff Formation

The Mississippian is represented in this area only by the Banff shale formation. The Pekisko, Shunda, Debolt and Stoddart formations have been removed by erosion. In nearby wells the Banff formation consists predominantly of black fissile shale, calcareous blocky shale and argillaceous limestone. These beds thin from the southwest to northeast across the permit areas and the extreme eastern part of the permits probably is very close to the truncated edge of the Mississippian Banff formation. From this point eastward and northward the Lower Cretaceous shales rest on the Upper Devonian.

Lower Cretaceous

Cretaceous rocks are believed to underlie the drift in

the Permit areas. For the most part the Cretaceous beds consist of medium to dark grey, micromicaceous, somewhat fissile, marine shale with ironstone. However, capping the high hills to the east and southeast such as Cameron Hills and Watt Mountain, the top of the Cretaceous includes sandy beds which are probably correlative with the Upper Cretaceous formations. Within the permit areas, especially the eastern parts, the Cretaceous sediments overly the eroded surface of the Devonian Hay River Limestone. Towards the western portion of the area Banff shales of Mississippian age may be present.

STRUCTURE

The entire area of the permit is covered with glacial drift, therefore, no details on the attitude of the bedrock can be obtained by surface geological work. Information obtained from outcrops and from deep tests outside the permit areas indicate that the regional dip is to the southwest at a rate of about 20 to 30 feet to the mile. Local variations in this dip and reversals of dip are present in the region, but these can only be located by geophysical methods or by drilling.

CONCLUSIONS AND RECOMMENDATIONS

The Kakisa River area is located in the Interior Plains physiographic province of Western Canada, and like much of this physiographic province, the bed rock is covered by a mantle of

glacial drift, muskeg, small lakes and numerous meandering streams.

The area is characterized by several glacial features such as low glacial ridges, grooves, small escarpments and knob-and kettle topography. These features are of glacial origin and are not indicative of any geologic structure.

Deep drilling in the area has indicated that beneath the subject permit areas there are strata favourable for the accumulation of hydrocarbons. The present surface work, however, failed to locate any structural anomaly which might trap oil or gas and, therefore, before a deep test can be drilled geophysical work is recommended.

W. I. Wright Ph. D.

120°07½'
120°00'
119°52½'
119°45'
119°37½'
119°30'
119°22½'
119°15'
119°07½'
60°30'
60°25'
60°20'
60°15'
60°10'
60°05'
60°00'

978
979
980
975
976
977

RIVER
ARISA

LIMIT OF PHOTOGRAPHIC COVERAGE

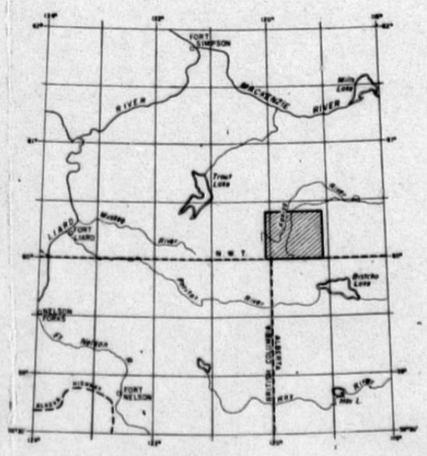
B.C.
NORTHWEST TERRITORIES
ALBERTA

59-1-4-10

MOBIL OIL OF CANADA LTD.
CALGARY ALBERTA

NORTHWEST TERRITORIES
SURFACE GEOLOGICAL MAP OF PERMIT AREAS
975-976-977-978-979-980

Scale: 1 inch to 2 miles



INDEX MAP

Magnetic declination at center of sheet 30°30' East

LEGEND

- LOW ESCARPMENT
- MUSKEG
- KNOB & KETTLE TOPOGRAPHY
- LOW RIDGES
- GLACIAL GROOVES

GEOLOGICAL REPORT

ON

PERMIT AREAS 1054 and 1055

NORTHWEST TERRITORIES

BY

J. Harrison

and

W. I. Wright

Calgary, Alberta
October 27, 1957

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One Geological Map
One Figure (No. II)

INTRODUCTION

This report presents the results of a geological investigation of Northwest Territories Permits Number 1054 and 1055, and adjacent areas. The field work upon which the report is based was carried out during the last week of August, 1957. The object of the survey was to study the stratigraphy and structural geology of the area for the purpose of obtaining information on potential oil bearing structures. In addition, Pleistocene and Recent geology, such as the nature and thickness of the surface deposits were studied for reason of their importance to geophysical surveys and drilling programs. Notes were also made on the topography and vegetation insofar as these features would affect future operations in the area.

During the work, the field party was served with a Beaver aircraft situated at Dovie Lake. This aircraft was used to move the party to and from the field and to transport gasoline and supplies from Fort Nelson, British Columbia. A Bell helicopter was used to transport the men within the field.

The air photographs used in this evaluation were obtained from the Royal Canadian Air Force. The quality of the photography is generally good. Scale control for the map was afforded by identification on the air photographs of geographic features on published topographic maps of the area. All information derived from the stereoscopic examination of the air photographs was transferred to the map accompanying this report.

INTRODUCTION

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L O C A T I O N AND A C C E S S I B I L I T Y

Permit Areas 1054 and 1055 are located in the Simpson-Liard National Topographic map sheet No. 95 S.E. More specifically, Permit 1054 falls within 60° 20' to 60° 30' North Latitude and 122° 30' to 122° 45' West Longitude and Permit 1055 includes the area within 60° 10' to 60° 20' North Latitude and 122° 30' to 122° 45' West Longitude. Permit Area 1054 contains 63,212 acres, and Permit Area 1055 contains 63,534 acres.

The most accessible route to the subject permit areas is via the Alaska Highway to Fort Nelson, a distance of 300 miles from the rail terminal at Dawson Creek, British Columbia. From Fort Nelson to the permits there are no roads for summer travel. The most economical and practical access to the permits, during the summer months, is by float equipped aeroplane. There are no lakes within the permits suitable for landing an aeroplane, however, Bovie Lake located approximately six miles to the west is a very satisfactory base.

In order to move heavy equipment into the permits during the summer months, the most accessible route is believed to be as follows: boat and barge transport from Fort Nelson down the Nelson and Liard Rivers to Fort Liard. From this locality a road could be constructed on comparatively dry ground along the banks of Petitot River to Bovie Lake. From Bovie Lake to the permits, the terrain is very wet and roads suitable for summer travel would be difficult and expensive to construct.

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Of importance in the construction of summer roads in this region are the glacial ridges, sometimes referred to as drumlinoids. These are long, narrow, parallel ridges which are rarely 300 feet wide at the base and have a relief of 5 to 25 feet, and a length up to four miles. The general pattern of these ridges trend N 70° E, with a few superimposed trending N 70° W. The important feature of these ridges is that they constitute dry ground, above the wet muskeg, which would be satisfactory for summer road construction.

For access to the subject permit areas during the winter months, the tractor trail which connects Fort Nelson with Fort Simpson can be used for a distance of approximately 70 miles out of Fort Nelson. From this point a winter road has recently been bulldozed to Bovie Lake to the location of the wildcat well, Texaco-N.F.A. Bovie Lake No. 1. From this location to the permit areas, a distance of 12 miles, there are no bulldozed trails. The terrain through this 12 miles to the permits, and also within the permits, is relatively flat muskeg country, diversified by numerous small lakes, and a few of the aforementioned ridges. A small scrubby spruce grows in the muskeg areas whereas poplar and jackpine are common in the dryer country.

Within the reservation and in the area to the west, as far as Bovie Lake, an attempt was made with the use of photographs and a check on the ground to map the different types of terrain in as much detail as time would permit. From this work it is quite apparent that because of the wet muskeg condition and their resultant intermittent drainage which occupies a large proportion of the area, it would be very impractical to attempt any preliminary exploration during the unfrozen period of the year.

TOPOGRAPHY AND DRAINAGE

The entire area of the permits is one of low relief. The average elevation is about 1500 feet above sea level. The only relief is due to the rivers and creeks that cut channels of depth which vary from a few feet to 200 feet. Low morainal hills, probably not exceeding 50 feet in height, provide some relief in the interstream area.

The permit areas are drained by the Muskeg and Arrowhead Rivers. These streams join with the Liard River.

STRATIGRAPHY

General Statement

Within the permit areas, bedrock was observed only along the Muskeg River. The strata here consists of interbeds of sandstone and shale of Lower Cretaceous age.

The nearest exposures of older formations are found, some eight miles to the west on the Bovie Lake structure. In this locality strata of Permo-Pennsylvanian and Mississippian ages are represented and still further to the west in the Liard Mountains beds of Devonian and Silurian ages are exposed.

To the east-northeast of the permit areas, along Great Slave Lake and the tributaries of the Mackenzie River, the Mississippian and Permo-Pennsylvanian sediments are absent so that only Silurian and Devonian strata comprise the Palaeozoic section.

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Recent deep wildcat wells in the extreme northeastern part of British Columbia, and the Northwest Territories have made it possible to predict, with a fair degree of accuracy, the thickness and lithology

of the buried formations of the permit areas. Based on this well information and that obtained from regional surface studies, a composite stratigraphic columnar section has been prepared for Permit Areas 1054 and 1055 (Figure II).

A brief description of each of the formations beneath the permits follows:

SILURIAN

About 500 feet of Silurian strata are exposed on Hahni Butte. These strata consist of silicious limestone and dolomite alternating in dark and light colored beds about three feet thick. Most of the rock is fine-grained, hard and dense, and has been indurated by silicious and calcareous solutions.

To the northwest of the map area, in the Great Slave Lake region, wells have penetrated over 800 feet of beds believed to be of Silurian age. The basal part of this section is known as the Red Beds and consist of red calcareous shale, and gypsum. The overlying beds, some 500 feet thick, are made up of dolomite and anhydrite.

In wells drilled nearer to the subject permit areas in British Columbia, a section somewhat similar to that found at Great Slave has been encountered. This Silurian section in British Columbia has been broken down into the Red Beds at the base overlain by the Chinchaga formation (Figure II).

DEVONIAN

Middle Devonian

Like the Silurian, the Middle Devonian beds crop out west of the subject permits and to the east-northeast along Great Slave Lake. In

addition numerous wells in northwest British Columbia have penetrated these beds.

Based on our present information, we are of the opinion that the Middle Devonian in the permit areas is more like that found at the Great Slave section than in the mountains to the west. Using the information from the above mentioned wells, the Middle Devonian has been divided into three main formations. These are, from bottom up, as follows: Keg River, Muskeg and Slave Point.

Keg River

In the nearest deep test well, the Keg River formation has a thickness of 220 feet. It consists mainly of dolomite of the reefoid type. Over wide areas, however, the Keg River formation varies considerably in lithology. In some areas argillaceous limestone with brown bituminous shale partings are present. In others, limestone and dolomite predominate, and in a few wells anhydrite appears along with the dolomite and limestone.

The base of the Keg River formation is selected at the first appearance of the Chinchaga evaporitic series. The Middle Devonian Muskeg formation overlies the Keg River formation. In some areas this contact is difficult to pick and, for this reason, the two formations are shown on the stratigraphic column (Figure II) as one unit.

Muskeg

The Muskeg formation varies considerably in lithology throughout northern Alberta, British Columbia and the Northwest Territories. In the nearest deep test studied, the Muskeg formation consists mainly of dolomite. To the southeast, in Alberta, this dolomite facies changes

to interbedded dolomite and limestone, and still farther to the south anhydrite is prodominant with dolomite and limestone present in small amounts.

Slave Point

The Slave Point formation has a wide distribution in the Northwest Territories, Alberta and British Columbia. It outcrops on Great Slave Lake where it was first described by Cameron[1] of the Canadian Geological Survey. Within the general area of the subject permits, this formation has a thickness of about 300 feet and consists almost entirely of limestone. In some cases a few feet of anhydrite and dolomite occur near the base. The limestone is brown, light brown and light yellowish grey and micro-fragmental. The contact of the Slave Point formation with the overlying Upper Devonian Hay River shale is sharp and probably conformable.

UPPER DEVONIAN

Hay River Shale

The type section of the Hay River shale is exposed on the Hay River, about 140 miles to the east-northeast of the report area. Also it has been encountered in all deep test wells in nearby areas. In the subject report area, the Hay River shale is expected to be about 2000 feet thick. The basal part is believed to be made up of greenish grey shales with a few interbeds of limestone. In some wells, however, the extreme basal part consists of dark grey non-calcareous shale with small carbonaceous flecks and in places bituminous flecks.

[1] Cameron, A.E. - Geological Survey of Canada
Summary Report, Part B, 1921.

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The basal part of the Hay River shale has been correlated with the upper part of the Beaverhill Lake formation of central Alberta. The main part of the formation is equivalent in age to the Woodbend and the extreme upper part may be the same age as the Winterburn formation of central Alberta.

MISSISSIPPIAN

The Mississippian formation is exposed on the Bovie Lake structure about eight miles to the west of Permit Areas 105$\frac{1}{4}$ and 1055. At this locality the Mississippian consists principally of limestone and chert with thin interbeds of black platy shale. The limestone is dense and finely crystalline, brownish grey on fresh surfaces, and weathers light grey to buff. It is in part massive and poorly bedded, and in part sandy, silty, and well bedded. Beds up to six inches in thickness of black papery shale occur at irregular intervals throughout the limestone.

In the subsurface of Permit Areas 105$\frac{1}{4}$ and 1055, the Mississippian limestone can be expected to be present. This limestone will be underlain by series of shale and interbedded shale and limestone known as the Banff formation.

PERMIAN AND/OR PENNSYLVANIAN

Sandstone beds believed to be either Permian or Pennsylvanian in age occur at the surface on the above mentioned Bovie Lake structure.

The sandstones are pale yellowish brown fine grained quartz, clean and well sorted. Stems or roots and numerous odd sedimentary structures occur at concentric mounds on the bedding plains. These sandstones weather to brown or greyish brown due to iron staining. In some outcrops chert bands and cross-bedding are common.

Strata of a similar lithology can be expected in the subsurface at Permit Areas 1054 and 1055.

LOWER CRETACEOUS

Lower Cretaceous rocks are believed to underlie the glacial drift in the subject permit areas. Where exposed at several localities along the Muskeg River in Permit Area 1055, they consist of thick sandstone beds separated by drift covered intervals probably made up of shale. The sandstones are grey, buff weathering, poorly consolidated and thick bedded. They are characterized by cross-bedding, ripple marks, plant fragments and form near vertical cliffs along the river.

STRUCTURE

Permit Areas 1054 and 1055, are located within the plains structure province of Western Canada, and as such, dips in the order of less than one degree can be expected. On the individual outcrops along the Muskeg River the amount of dip from horizontal is so small that no determination can be made. However, when viewed from a helicopter and several outcrops come under observation, a distinct westward dip can be detected.

The sandstones are pale yellowish brown fine grained quartz, clean and well sorted. Stems or roots and numerous odd sedimentary structures occur at concentric mounds on the bedding plains. These sandstones weather to brown or greyish brown due to iron staining. In some outcrops chert bands and cross-bedding are common.

Strata of a similar lithology can be expected in the subsurface at Permit Areas 1054 and 1055.

LOWER CRETACEOUS

Lower Cretaceous rocks are believed to underlie the glacial drift in the subject permit areas. Where exposed at several localities along the Muskeg River in Permit Area 1055, they consist of thick sandstone beds separated by drift covered intervals probably made up of shale. The sandstones are grey, buff weathering, poorly consolidated and thick bedded. They are characterized by cross-bedding, ripple marks, plant fragments and form near vertical cliffs along the river.

S T R U C T U R E

Permit Areas 1054 and 1055, are located within the plains structure province of Western Canada, and as such, dips in the order of less than one degree can be expected. On the individual outcrops along the Muskeg River the amount of dip from horizontal is so small that no determination can be made. However, when viewed from a helicopter and several outcrops come under observation, a distinct westward dip can be detected.

CONCLUSIONS AND RECOMMENDATIONS

The permit areas under review are located in the interior plains physiographic province of Western Canada, and like much of this physiographic province, the bedrock is largely covered by a mantle of glacial drift, muskeg, small lakes and numerous meandering streams. Several outcrops of Lower Cretaceous sandstone were found along the Muskeg River. From these a very gentle westward dip was observed. Apart from this feature no structural observations could be made.

Deep drilling in adjacent areas of British Columbia and the Northwest Territories, and field work carried out in the mountains to the west indicate that strata favorable for an accumulation of hydrocarbons will be found beneath the subject permit areas. The present surface work, however, failed to locate any structural anomaly which might trap oil or gas and, therefore, before a deep test can be drilled, geophysical work is recommended.

57-1-4-11

STRATIGRAPHIC COLUMNAR SECTION

PERMIT AREAS 1054 & 1055
NORTHWEST TERRITORIES

SCALE: 1 INCH = 500 FEET

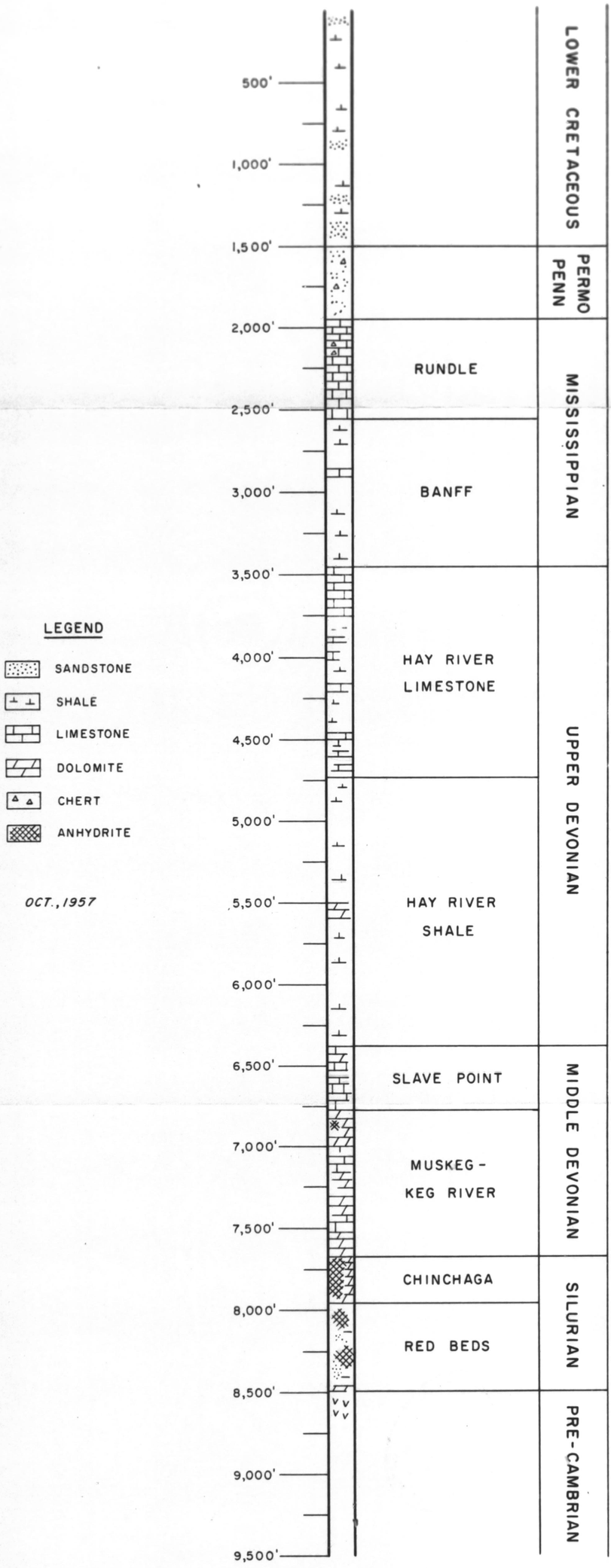

FIGURE 2

To accompany "Geological Report on Permits 1054 & 1055" by Messrs. Wright & Harrison for Mobil Oil of Canada. Oct. 27/57

P. 1054

P. 1055

ARROWHEAD RIVER

MUSKEG RIVER

BOVIE LAKE

123°00'

122°45'

122°30'

60°20'

60°10'

57-1-4-11

GEOLOGICAL MAP

OF

NORTHWEST TERRITORIES PERMITS 1054 & 1055 AND ADJACENT AREA

Scale: 1" = 2 Mi.

Oct., 1957

W.L.W.

LEGEND

- LOWER CRETACEOUS SANDSTONE
- SWAMP OR MUSKEG
- INTERMITTENT STREAM
- RIVER AND LAKE