

PRELIMINARY REPORT

J. H. HIRSHHORN NORTHWEST OIL AND GAS PERMITS
CANOT LAKE AREA, N. W. T.

Prepared for

J. H. Hirshhorn Enterprises

January, 1959

J. C. SPROULE & ASSOCIATES

GEOLOGICAL & EXPLORATION CONSULTANTS

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PRELIMINARY REPORT

J. H. HIRSHHORN NORTHWEST OIL AND GAS PERMITS

CANOT LAKE AREA, N. W. T.

INTRODUCTION

At the request of W. R. Newman of J. H. Hirshhorn Enterprises, the firm of J. C. Sproule & Associates conducted a geological survey of the Company's holdings in the Lower Mackenzie Basin, Northwest Territories. The Petroleum and Natural Gas Permits held by the Company and the corresponding acreages are as follows:

<u>Permit No.</u>	<u>Acreage</u>	<u>Permit No.</u>	<u>Acreage</u>
2261	48,202	2272	48,890
2262	48,202	2273	48,890
2263	48,202	2274	48,890
2264	48,202	2275	48,890
2265	48,546	2276	49,234
2266	48,546	2277	49,234
2267	48,546	2278	49,234
2268	48,546	2279	49,578
2269	24,316	2280	49,578
2270	24,316	2281	49,578
2271	48,890		
Total Acreage -			<u>976,510</u>

The objective of the survey was to compile a geological map of the Permit area and to study stratigraphic sections within and adjacent to the area in order to acquire an understanding of the subsurface geology. Coupled with the examination of outcrops within the area, a photogeological study was to be made prior to, during, and following the actual time spent in the field.

A crew, consisting of geologist N. Peterson, student assistants A. Sankeralli and J. Burton, moved into the area on July 21, 1958. Senior geologist, G. K. Williams, arrived on August 1. The field party remained in the area until September 6. W. R. Newman visited the field party from September 2 to September 4.

Helicopter crews and the time they spent on the project consisted of the following: Pilot A. Hudson and Engineer A. Nabi of Spartan Helicopters from July 28 to August 13, Pilot W. Muise and Engineer M. Girardin, subcontracted by Spartan Helicopters from August 14 to August 19, and Pilot J. Durkie and Engineer C. Wallace with J. C. Sproule & Associates' helicopter from August 20 to August 23 and from September 2 to September 6. The above helicopters were supplemented by a Beaver aircraft, piloted by Ron Wells of Cascade Air Services, and used for long range scouting, gas caching and supplying the camp.

Additional transportation was supplied by a 17-foot prospector canoe.

Stratigraphic sections measured within or adjacent to the area consist of the following:

1. Carcajou Lake - Basal Cretaceous sandstone;
2. Iroquois, Carnwath and Anderson Rivers - Ramparts and Bear Rock formations;
3. Hare Indian River - Ramparts and Bear Rock formations and Silurian - Ordovician strata.

Further from the area detailed stratigraphic studies were carried out by two separate parties. One party, consisting of three senior geologists, spent approximately two weeks studying stratigraphic sections in the Mackenzie and Franklin mountains. The other party, consisting of four senior geologists, spent four weeks in the Richardson Mountains.

The results obtained from these studies will be incorporated in the final geological report.

The present report is illustrated by a detailed geological map and structure contour map drawn on the contact between the Middle Ramparts formation and the Lower Ramparts formation. Both maps are in the scale of 4-miles to the inch. The final report will include, in addition to the above, the following:

1. An alternate interpretation of the structure contour map.
2. Photogeological mosaics of the Permit area.
3. A regional geological map.
4. Stratigraphic sections and strip logs of all stratigraphic sequences measured within the area as well as sequences measured in the Mackenzie, Franklin and Richardson mountains which are pertinent to the subsurface of the Permit acreage.
5. Kodachrome prints of topography, rock outcroppings and stratigraphic sequences.
6. Our conclusions as to the oil and gas prospects of the Permit acreage and recommendations for future work.

GENERAL GEOLOGY

The Permit acreage is located on a broad plain, the boundaries of which are the Richardson Mountains 200 miles to the west of the Permit acreage, the Franklin Mountains 80 miles to the south and the Precambrian Shield 160 miles to the east.

The regional dip of the area is to the southwest, becoming more westerly further north.

Thin Cretaceous strata form bedrock over most of the southern part of the Permit acreage and unconformably overlies Paleozoic Devonian strata. The unconformity cuts progressively deeper into the Paleozoic from west to east. In the northern part of the Permit area the Cretaceous is missing and Devonian rocks form the bedrock.

There are an estimated 2,000 feet of sediments underlying the Permit acreage.

STRATIGRAPHY

Rock exposures within or near the Permit area are either Cretaceous or Middle Devonian. The accompanying geological map indicates their distribution within the map-area. The thicknesses shown in the following table of formations represent maximum exposures within or near the Permit acreage.

Table of Formations

<u>Age</u>	<u>Formation</u>	<u>Description</u>	<u>Thickness Feet</u>
Cretaceous	Unnamed	Shale, grey, fissile, soft, uniform texture, bentonitic, ironstone bands and concretions, pelecypods in talus. Only a few small outcrops seen in northeastern part of area.	3+
	Unnamed	Basal Sandstone, fine to coarse-grained, 100+ subrounded grains, quartzose, friable, torrential cross-bedding with bituminous and carbonaceous layers, in part oil-stained, weathers almost white. Outcrops over southern half of area becoming less frequent to the north and east.	
- UNCONFORMITY -			
Upper Devonian	Fort Creek	Shale, dark grey to black, fissile to platy, hard, bituminous, petroliferous odor, white residue on surface, bright yellow and red weathering. Outcrops to the west of the Permit acreage and is not considered to underlie any of the Permit acreage.	135

- UNCONFORMITY -

<u>Age</u>	<u>Formation</u>	<u>Description</u>	<u>Thickness</u> Feet
Middle Devonian	Ramparts Group		
	Upper	Limestone - medium to dark brownish grey, very fine crystalline to very fine granular texture, thin indistinct bedding to massive reefal bedding, fossiliferous. From the "Ramparts" at Fort Good Hope to the northwest the massive limestone undergoes a facies change to a calcilutite. To the north this limestone also thins radically due to erosion. Exposures are limited to the southern boundary of the Permit acreage and a small tight syncline in the northern part of the area.	106+
	Ramparts		
	Middle Ramparts (Hare Indian Shale)	Shale - grey, green cast, fissile, spores and speckling common, calcareous in part. Underlies southern portion of area and outcrops over much of northern half. Basal part consists of a black, hard, platy, often calcareous, bituminous shale.	600*
	Lower Ramparts	Limestone and shale - grey, fine textured, nodular, very fossiliferous limestone with thin shale interbeds. Laterally this formation may change either to a true bioherm or a calcareous shale. The contact of the Middle and Lower Ramparts outcrops frequently and is the basis for the structure contour map.	
	Bear Rock	Typically a breccia consisting of large blocks of laminated brown limestone in a brown limestone matrix, porous in part, bituminous odor. Also occurs as a non-breciated brown, bedded, laminated limestone. Does not outcrop within the Permit area.	550+
- UNCONFORMITY -			
Ordovician Silurian		Dolomite - light grey, very fine crystalline, uniform granular texture, massive with a few thin-bedded zones. Reefoid in some areas with vugs and chert inclusions. Does not outcrop within Permit acreage.	200*

The above Table of Formations will be expanded in the final report with the incorporation of the stratigraphic sequences measured in the Mackenzie, Franklin and Richardson Mountains.

STRUCTURE

The dominant structural trend, especially in the southern two-thirds of the Permit acreage, is northwest. To the north a secondary northeast trend becomes evident. Lines of weakness in the basement complex, resulting in normal faults with little displacement, are thought to be responsible for these trends. These faults are probably similar to those of the mountains to the south but of much less magnitude. Surface evidence of these faults are Manuel, Yeltea and Carcajou Lakes. All of the above are long, narrow lakes, parallel to one another and with their long axis in a northwest direction.

The northeast trend, in the northern third of the area, is expressed in a tight syncline and in several dips all striking approximately 40 degrees azimuth.

The structure contour map, Figure II, drawn on the contact between the Middle and Lower Ramparts indicates a structural high across the southern part of the Permit acreage. A nose of this high extends northward into the Permits.

The fact that the Lower Ramparts-Middle Ramparts contact occurs near stream level in many cases suggests that the topography of the area is controlled, to some extent, by the underlying structure. Topographically high areas should reflect underlying structural highs. In regard to this, the drainage divide shown on Figure II, is further evidence of the structural high mapped in the southern extremity of the Permit acreage.

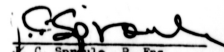
SUMMARY

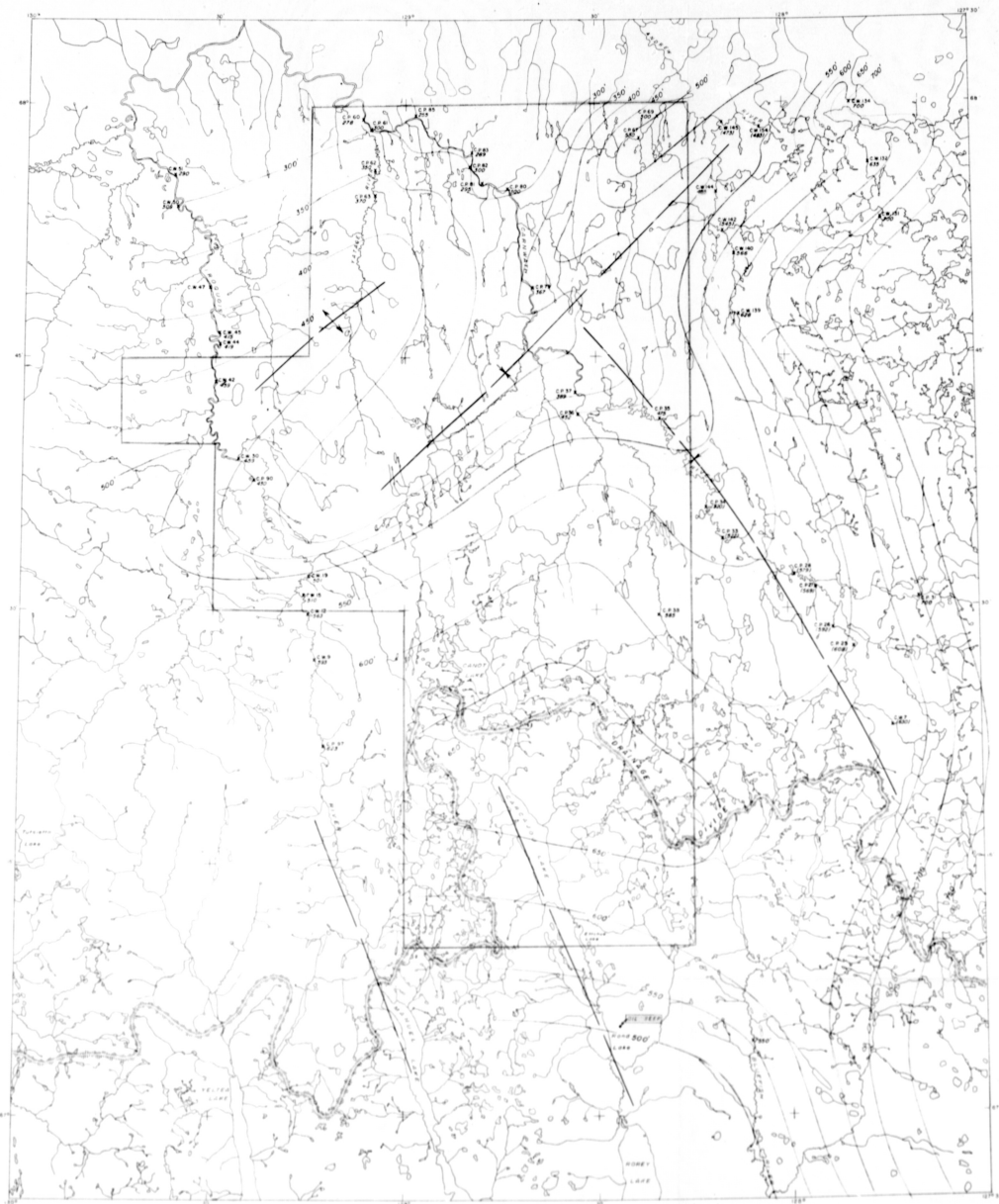
This preliminary report briefly describes the Permit holdings under consideration, the field crew, the equipment used and time spent in the field. An outline of the procedures used and results obtained is given also.

The field work, as well as much of the office work has been carried out, but until the latter is completed no final conclusions as to the oil and gas prospects or recommendations for future work can be arrived at. Our final report should be completed in February, 1959.


G. K. Williams, P. Eng.

January 9, 1959.
901 - Eighth Avenue West,
Calgary, Alberta.


J. C. Sprule, P. Eng.



* * * * * Outcrop Location
 * * * * * Elevation to Top of Lower Ramparts Formation - measured
 * * * * * Estimated
 ——— Structural Location
 ——— Outline of P.M.S. Units

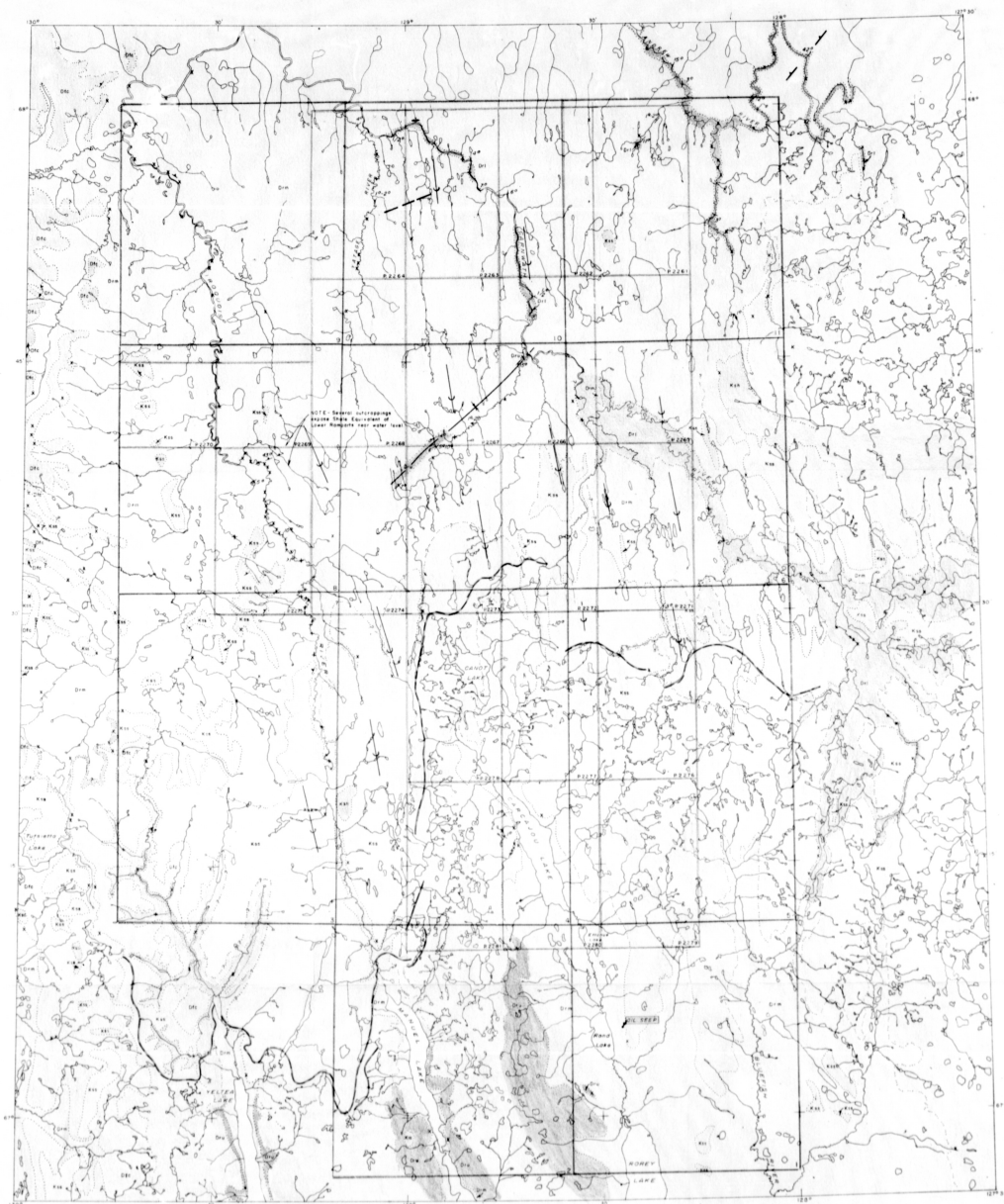
STRUCTURE MAP CANOT LAKE AREA, N.W.T.

Top of Lower Ramparts Formation

Contour Interval - 50 ft. Datum - Sea Level



Interpretation by N. Peterson, December 1958



LEGENDS

GEOLOGICAL

- CRETACEOUS**
- Unaffiliated
 - Shale
 - Basal Sandstone
- DEVONIAN**
- UPPER**
- Fort Creek Fm.
- MIDDLE**
- Ramparts Fm. (Upper)
 - Ramparts Fm. (Middle) (May include Upper & Lower Ramparts Shale Facies)
 - Ramparts Fm. (Lower)

- Geological Contact
- Geological Contact (Indefinite)
- Geological Contact (Suggested)
- Fault (Geological)
- Fault (Thrust) (Triangle indicates dip direction)
- Synclinal Axis
- Anticlinal Axis
- Rock Outcrop
- Bedding Altitude (Vertical, Horizontal)
- Elevation Direction N. Degree of Dip
- Bedding Altitude (Photogeological)
- Glacial Striations & Direction of Ice Movement
- Northern Boundary of Pitted Moraine (Photogeological)

GENERAL

- Permit Outline
- Mining Outline

PRELIMINARY GEOLOGICAL MAP

CANOT LAKE AREA, N.W.T.

SHOWING

J.M. HIRSHHORN NORTHWEST OIL & GAS PERMITS

SCALE: 1:250,000

PREPARED BY G.K. WILLIAMS & S.N. PATTERSON, SUMMIT, 1958