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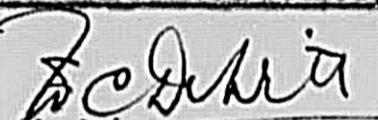
Western Decalta Petroleum Limited,
703 - 5th Street S.W.,
Calgary, Alberta.

Gentlemen:

We have the pleasure to submit herewith our Photogeological Report on the Buffalo Lake Block, Northwest Territories and Alberta, Permit # 3233.

Yours very truly,

DEWITT AND ASSOCIATES LTD.



J. F. C. DeWitt, Ph.D., P. Geol.

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PHOTOGEOLOGICAL REPORT

on the

BUFFALO LAKE BLOCK

Northwest Territories and Alberta

Permit No. 3233

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PHOTOGEOLOGICAL REPORT

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1. INTRODUCTION

This report deals with the geology and geomorphology of the Buffalo Lake Block.

The map and this report are based on a photogeological study carried out during the past few weeks.

The accompanying map represents in detail the geology and geomorphology of this area as far as could be interpreted from the several aerial photographs.

The project area is 402 square miles and lies between the $115^{\circ} 50' 00''$ and $116^{\circ} 20' 00''$ Meridians west and the $59^{\circ} 52' 30''$ and $60^{\circ} 12' 30''$ Parallels north.

2. PHOTOGRAPHY AND MAPS

Photographic coverage of the area was procured by us from the Department of Mines and Technical Surveys of the Federal Government in Ottawa.

The photographs are 9 x 9 inch vertical photographs. The photographic strips were flown in an east-west direction; photographic coverage of the area was sufficient. The quality of the photographs was good.

As base maps were used:

No. 85-C	Tathlina Lake	1:250,000
No. 85-B	Buffalo Lake	1:250,000
No. 84-N	Steen River	1:250,000
No. 84-O	Whitesand River	1:250,000

All information of a geologic and geomorphologic nature was transferred to these maps.

The outlines of the project and permit areas are shown on this map.

3. GEOGRAPHY AND TOPOGRAPHY

(a) Drainage

The project area lies partly in Alberta, partly in the Northwest Territories, immediately southwest of Buffalo Lake.

The area is drained in the south by the Yates River and its tributaries, and in the north by several unnamed rivers and their tributaries. All these rivers flow to the northeast, where they enter Buffalo Lake.

In the southern part of the project area the courses of many rivers are governed by faults. These rivers have mostly an asymmetric character.

(b) Land Forms

The project area has a plains-type topography, and is

part of the Interior Plains (H. S. Bostock, 1948).

It is flat and extensively covered with muskeg; only in the most southeastern corner of the map area are there some higher grounds, as indicated on the map.

The project area has probably undergone post-glacial uplift, as has the whole region, though indications of this post-glacial uplift are scarce and not very clear in the project area.

The project area was heavily eroded by the glaciers and very probably had already been quite maturely eroded in pre-glacial time.

The main drainage by the above mentioned rivers seems to be antecedent, not only to the present topography but also to the previous topography.

(c) Glaciation

Glaciation had such an important effect on the topography that the topography of the whole area was totally changed.

The whole area was covered with ice which must have been of Keewatin origin.

The flow of the glaciers was mainly northeast-southwest. Long ridges of glacial deposits trend in this direction.

Due to the thick sheet of glacial material, no outcrops were observed in the map area.

4. GEOLOGY

As there is little known of the geology of the surrounding area, it is very difficult to link the geology of the project

area to that of the surrounding regions.

The only map covering part of the project area (north of $60^{\circ} 00'$) is by R. J. W. Douglas (1959). It shows the assumed boundaries of the divisions of the Upper Devonian Simpson Formation. These boundaries are also shown on our map.

In the southern part of the project area the rivers have generally a very straight course. They also show a marked asymmetry with respect to the tributaries. There are very often no tributaries on the northwest side of the rivers.

These phenomena are, in the opinion of the writer, caused by northeast-trending faults, which are undoubtedly reflections of faults in the Shield.

The whole map area is covered by glacial material and, due to the flatness and lack of proper drainage, there are large muskeg areas.

Not one single outcrop could be observed on the aerial photographs.

5. STRATIGRAPHY

R. J. W. Couglas (1959) assumed that three divisions of the Upper Devonian Simpson Formation outcrop in our map area.

The youngest one consists of greenish-grey shale and siltstone. The middle one of varicoloured limestone, shale and reefs, and the oldest one is the Alexandra Formation consisting of limestone, shale and reefs.

6. OIL AND GAS POSSIBILITIES

The youngest consolidated outcropping formation in the project area is the Upper Devonian.

There is no cover of younger formation with structures and stratigraphic traps.

The total depth of the sediments is small, due to the vicinity of the Shield.

We regret to say that, in our opinion, the possibilities for accumulations of hydrocarbons on a commercial scale are very slim.

BIBLIOGRAPHY

Hage, C. O.
1945: Geological Reconnaissance Along Lower Liard
River, Northwest Territories, Yukon, and
British Columbia; Geol. Surv., Canada,
Paper 45-22.

Law, J.
1955: Geology of Northwestern Alberta and Adjacent
Area; Bull. Am. Assoc. Pet. Geol., vol. 39,
pp. 1927-1978.

Douglas, R. J. W.
1959: Great Slave and Trout River Map-Areas,
Northwest Territories; Geol. Surv., Canada,
Paper 58-11.

