

673-2-6-44-011

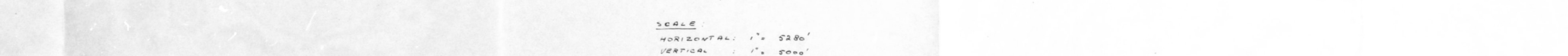
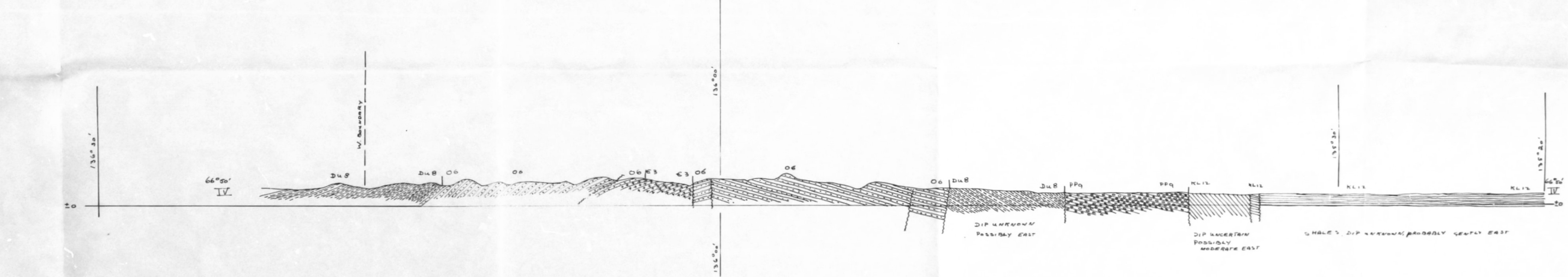
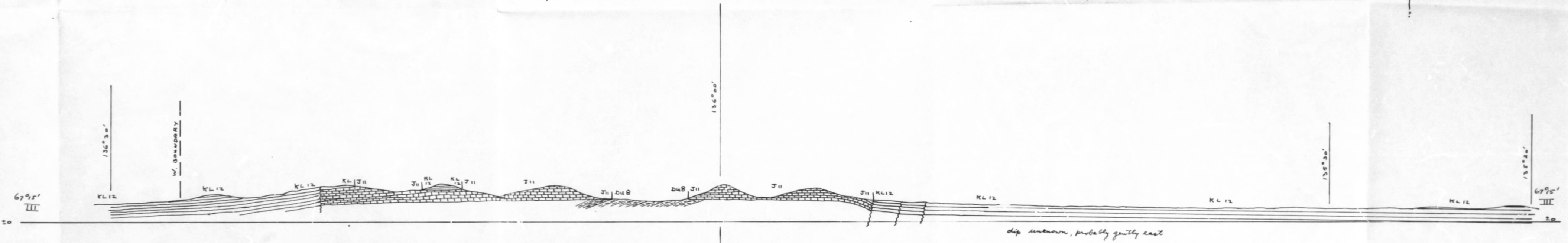
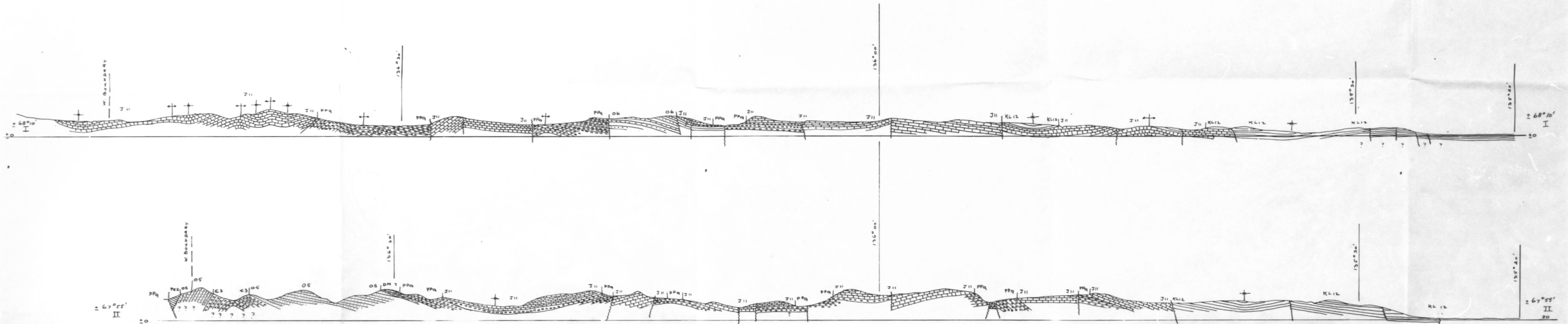
PHOTOGEOLOGIC SURVEY

OF THE

RICHARDSON MOUNTAINS

(Yukon & N.W. Territories)

De Witt and Associates Ltd. for Aquitaine
Co. of Canada Ltd.



SCALE:
HORIZONTAL: 1" = 5280'
VERTICAL: 1" = 5000'

LEGEND

- KL12
- J11
- PPQ
- D48
- DM7
- O6
- E3
- C-PC

PHOTOGEOLOGIC SYMBOLS

- ⊕ BEDDING APPEARS HORIZONTAL
- ⊥ DIP 1°-3°
- ⊥ - 3°-10°
- ⊥ - 10°-25°
- ⊥ - 25°-45°
- ⊥ - 45°-89°
- ⊥ - Vertical
- ALIGNMENT



DeWITT AND ASSOCIATES LTD.

P.O. Box 1017

CALGARY 2, ALBERTA

TELEPHONE 249-7447

June 15, 1972

Aquitaine Company of Canada Limited,
540-5 th. Avenue S.W.,
Calgary, Alberta.



Gentlemen:

We have the pleasure to submit herewith our Photogeologic Report and
Maps on the Richardson Mountains, Yukon and Northwest Territories.

Yours very truly,
DeWitt and Associates Ltd.

A handwritten signature in dark ink, appearing to read "J. F. C. DeWitt", written over a horizontal line.

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

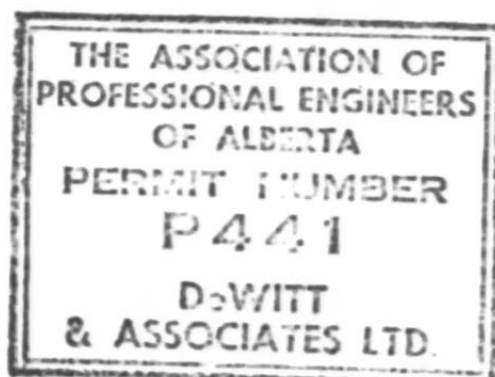
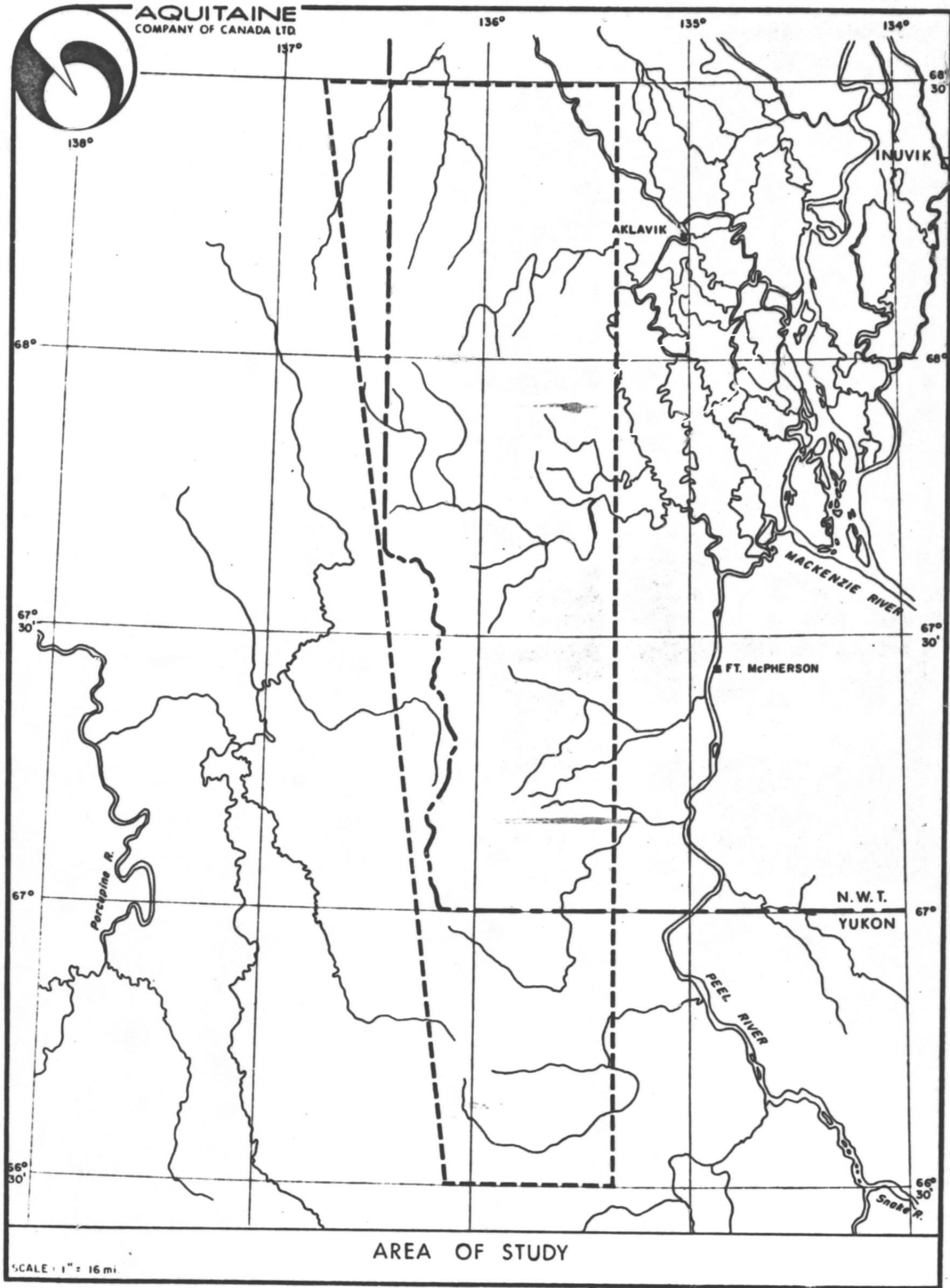


TABLE OF CONTENTS

1. INTRODUCTION	page 1
2. PHOTOGRAPHY AND MAPS	1
3. GEOGRAPHY AND TOPOGRAPHY	
DRAINAGE	3
LANDFORMS	3
GLACIATION	4
4. STRATIGRAPHY	5
5. STRUCTURAL GEOLOGY	6



AQUITAINE
COMPANY OF CANADA LTD



SCALE 1" = 16 mi.

AREA OF STUDY

PHOTOGEOLOGIC REPORT
on the
RICHARDSON MOUNTAINS
(Yukon and Northwest Territories)

INTRODUCTION

The report and maps are based on a photogeologic survey of the greater part of the Richardson Mountains during the past five months.

The maps represent in detail the geology of the area as far as it could be interpreted from the available aerial photographs.

The north boundary of the project area runs along the $68^{\circ} 15'$ parallel north, the east boundary along the $135^{\circ} 20'$ meridian west, the south boundary along the $66^{\circ} 30'$ parallel north and the west boundary along a line from $136^{\circ} 10'$ west on the $66^{\circ} 30'$ parallel north to $136^{\circ} 50'$ west on the $68^{\circ} 15'$ parallel north. (See plat).

The project area is approximately 3,752 square miles.

PHOTOGRAPHY and MAPS

PHOTOGRAPHY

Photographic coverage of the area was procured by Aquitaine Company of Canada from the Air Photo Library in Ottawa.

The photographs are 9 x 9 inch vertical photographs with a $2/3$ overlap within one flightline and a widely varying overlap between flightlines.

The majority of the photographs have a scale of approximately one inch to the mile; some flights have been flown at a considerable lower altitude, resulting in a scale of approximately 1 : 40,000.

Photographic coverage of the area was generally sufficient.

The exception was the coverage of the Aklavik Range in the northeast corner of the project area, between the Donna River and the Husky channel of the Mackenzie River.

This was somewhat disappointing as this area turned out to be one of the most interesting parts of the project area, at least from a structural point of view.

The photographic strips were flown in an approximate north-south direction.

The photographs were generally of a good quality.

MAPS

Photographic enlargements of the government maps 1 : 250,000 to a scale of 1"=1 mi. were made available by Aquitaine Company of Canada. These contoured enlargements were used as the base maps for the photogeologic maps.

Due to several technical causes of the enlargement process, discrepancies were observed in the fit between the different mapsheets. These discrepancies, mainly an inconsistency of direction, were of a minor nature and not greatly disturbing the general accuracy.

The map consists of 8 sheets, numbered from 1 to 8.

GEOGRAPHY AND TOPOGRAPHYDRAINAGE

The north part of the project area straddles the north-south running boundary between the Yukon and Northwest Territories and the project area as a whole lies immediately west and south of the Mackenzie River delta.

The area is largely drained by river systems which flow to the west, north, northeast and east.

The main drainage system of the southern part of the area is the Peel River and its tributaries, of which the Trail River, Road River, Vittrekwa River and Stony Creek are the more important ones.

The northern part of the area is drained by rivers and their tributaries which flow directly into the Mackenzie River delta.

The western part of the area is drained by the Bell and Rock Rivers and their tributaries.

LAND FORMS

The Richardson Mountains form a straight, and, except in their broad north end, narrow belt of rough country between Peel Plateau on the east and Porcupine Plain and Arctic Plateau on the west and they form a continuous watershed throughout their length.

For the most part, Richardson Mountains are no more rugged and are lower than the southern foothills of the Rocky Mountains, which they resemble somewhat in their bare slopes; their position adjacent to areas of relatively low relief - Mackenzie Delta, Peel Plateau, Arctic Plateau, and Porcupine Plain - is partly responsible for their being called mountains.

Towards their northern extremity these mountains form roughly parallel ridges striking north and merging in that direction with the surface

of Arctic Plateau.

Southward, Richardson Mountains narrow to 25 miles at Rat River Portage and to 12 miles opposite Road River. From Vittrekwa River to the south end of the mountains, at Peel River, they continue as a narrow belt.

Commonly the mountains have steep, smooth slopes, only few rough outcrops even on their ridge tops, and some of their ridges are long and even and, viewed from the air, resemble immense road embankments. These features suggest a former erosion surface truncating their tops (Bostock, 1948).

GLACIATION

No evidence of Pleistocene glaciation was found in the project area. No moraines were found and the rivers are occupying steep V-shaped valleys.

Some hanging valleys were observed in the Cretaceous plains in the eastern part, indicating a recent uplift, which might have been caused by a post-glacial uplift.

STRATIGRAPHY

In the project area strata were recognized of Pre-Cambrian, Cambrian, Siluro-Ordovician, Devonian, Permo-Pennsylvanian, Jurassic, Cretaceous and Quaternary ages.

Lithostratigraphic units were mapped in analogy with those shown on G.S.C. Map 10-1963.

Mapping of thin stratigraphic units as e.g. the Triassic as described by Jeletzky (G.S.C. 59 - 14) was omitted, as those units could not be recognized as such on the aerial photographs.

Angular unconformities were clearly observed, especially between the Permo-Pennsylvanian and the older formations and to a somewhat lesser degree between the Jurassic and the Permo-Pennsylvanian.

Map 10-1963 indicates that part of the eastern plains belongs to the Upper-Cretaceous age (unit # 13). As no lithological differences with the Lower-Cretaceous could be observed the contacts were sketched in in analogy with those of map 10-1963.

Age designations of several lithological units in the Aklavik Range are based on Jeletzky's observations (G.S.C. 59-14).

We are fully aware that the age assignments and correlations of Map 10-1963 were based on bulk lithographic units and have to be considered as tentative.

Contacts between the different stratigraphical units are in many places only approximate, mainly due to rapid facies changes (especially between the Jurassic and the Lower-Cretaceous) and insufficient observable differentiation on the aerial photographs.

STRUCTURAL GEOLOGY

The project area comprises of a mountain complex of varied structural trends as can be readily seen on the maps.

The structure is dominated by broad folds that are intimately related to steep faults.

No thrust faults were observed in the project area.

In several cases the inclination of the fault planes could be either observed directly or inferred from the course of the fault in the topography.

These inclinations were shown on the maps and the cross sections. Wherever no inclination could be observed or inferred, we had to draw the faults in the cross sections straight vertically.

MAP UNITS

Quaternary

Q

Cretaceous

{ upper Ku
lower K1

Jurassic

J

Permo-Pennsylvanian

PP

Devonian

{ upper Du
middle Lm

Silurian

Ordovician

O

Cambrian

C

Precambrian

