

GEOLOGICAL REPORT

PROPERTY OF

BIG RANTO ALBERTA OILS LIMITED

FORT PROVIDENCE AREA, GREAT SLAVE LAKE

N.W.T.

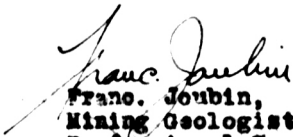
559-1-42

C E R T I F I C A T E

I, **Franco. Joubin**, of the City of Toronto, in the Province of Ontario, hereby certify:

1. That I am a Mining Geologist with business office at 510 Concourse Building, 100 Adelaide Street West, Toronto, Ontario.
2. That I am a graduate of the University of British Columbia, B.Sc., M.Sc., and have been practising my profession as a Mining Geologist for a period of 15 years.
3. That I have no direct interest whatsoever, nor do I expect to receive any, in the properties of Rio Tinto Alberta Oils Limited, as covered in the Geological Report attached hereto and have no interest nor do I expect to receive any interest in the securities of the Rio Tinto Alberta Oils Limited.
4. That the accompanying report is not based on a personal examination of the properties of Rio Tinto Alberta Oils Limited but upon an analysis of reports of other qualified Geologists.

Dated at Toronto, Ontario, this 7th day of June, 1950.


Franco. Joubin,
Mining Geologist, and
Professional Engineer, Ontario, &
British Columbia.

GEOLOGICAL REPORT
PROPERTY OF
NIO TINTO ALBERTA OILS LIMITED
FORT PROVIDENCE AREA, GREAT SLAVE LAKE, N.W.T.

June 7th, 1950.
810-100 Adelaide St. W.,
Toronto, Ontario.

Franc. Joubin
Franc. Joubin,
Mining Geologist, and
Professional Engineer, Ontario
and British Columbia.

GENERAL

The presence of oil seepages in the McKensie River area were first described, in 1889, by R. G. McConnell of the Geological Survey of Canada. The oil seepages of the Great Slave Lake area were first examined and described in detail by A. E. Cameron of the Geological Survey in 1916-17. Further studies of the oil possibilities of the area were conducted in 1921 by E. J. Whittaker and in 1921 by A. E. Cameron, both of the Geological Survey. In 1930 and later, J. D. Bateman did detailed geological work in the area. During and since World War II, the greatly expanded search for petroleum and gas, which has been very successful north and south of Great Slave Lake, has stimulated a renewal of interest in the oil seepages of the Great Slave area.

The writer is not personally familiar with these oil seepages or with the geology of the Company's holdings. This report is based on the reports and geological maps of other geologists familiar with the area described.

PROPERTY AND TITLE

The properties of Rio Tinto Alberta Oils Limited, consists of three parcels of land, known as Permits Nos. 211, 212 and 213, otherwise known as the Joe 11, Joe 12 and Joe 13 respectively. This report is submitted in support of applications for five additional Permits covering Joe 7, Joe 9, Joe 10, Joe 14 and Joe 15. Each Permit is square, measuring ten miles on the side. Total area of the Company's holdings will therefore be 800 square miles or 512,000 acres.

Permits 211, 212 and 213 are held under a "Permit to Explore for Petroleum and Natural Gas" under regulations outlined

in Order-In-Council No. P.O. 2322, dated May 9th, 1949. The five additional Permits applied for will also be held under these regulations which require the payment of deposit fees, acreage fees, and the performance of certain work.

LOCATION AND ACCESS

The Company's three Permits are located as shown on the accompanying "Plan of Property", together with the five Permits applied for.

The parcels, seven of which are contiguous, are in the Fort Providence area, west of Great Slave Lake and north of the McKensie River, N.W.T. This group of seven parcels lie between approximate latitudes $61^{\circ} 10'$ N. and $61^{\circ} 50'$ N., and approximate longitudes $116^{\circ} 40'$ W. and $117^{\circ} 40'$ W. The remaining single parcel lies some 25 miles to the east of the above-described group.

A description by metes and bounds for these eight parcels of ground, as stated in the application permits, is as follows:-

Joe No. 7.

Commencing at a point on the north shore of the easterly branch of the Horn River at a post placed in accordance with the Regulations; thence in a north-easterly direction 10 miles to a point, such point also being the most westerly extremity of Permit No. 212 issued under these Regulations; thence in a south-easterly direction along the southern boundary of the aforesaid Permit ten miles to a point, such point also being the most southerly extremity of the aforesaid Permit; thence in a south-westerly direction 10 miles to a point, such point also being the most northerly extremity of Permit 213 issued under these Regulations; thence in a north-westerly direction 10 miles to the place of beginning.

ANZAC DAY

WINN-DIXIE SLAVE LANE


●

8

10

3

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8

Joe No. 9.

Commencing at a point 100 yards from the most westerly extremity of Caen Lake and on the north shore thereof, where post has been placed in accordance with these Regulations, which point is also the most southerly extremity of Permit No. 211 issued under these Regulations; thence in a north-easterly direction 10 miles along the boundary of the said Permit to a point, such point also being the most easterly extremity of Permit No. 211; thence in a south-easterly direction 10 miles to a point; thence in a south-westerly direction 10 miles to a point on the north shore of an unnamed lake; thence in a north-westerly direction 10 miles to the place of beginning.

Joe No. 10.

Commencing at a point 100 yards from the most westerly extremity of Caen Lake and on the north shore thereof where a post has been placed in accordance with these Regulations; thence in a south-easterly direction 10 miles to a point located on the north shore of an unnamed lake; thence in a south-westerly direction 10 miles to a point, which point is also the most southerly extremity of Permit No. 212 issued under these Regulations; thence in a north-easterly direction 10 miles along the boundary of the said Permit to the place of beginning.

Joe No. 11.

Commencing at a point on the north shore of Caen Lake, approximately 100 yards from the most westerly extremity of Caen Lake, at which point a post has been placed and marked in accordance with these Regulations; thence in a north-westerly direction 10 miles to a point; thence in a north-easterly direction 10 miles to a point; thence in a south-easterly direction passing through a point on the north shore of an unnamed lake and also passing through a point on

the south shore of another unnamed lake 10 miles to a point; thence in a south-westerly direction 10 miles to the place of beginning.

Joe No. 12.

Commencing at a point on the north shore of Gaen Lake approximately 100 yards from the most westerly extremity of Gaen Lake, at which point a post has been placed and marked in accordance with the regulations; thence in a south-westerly direction 10 miles to a point; thence in a north-westerly direction 10 miles to a point; thence in a north-easterly direction 10 miles to a point; thence in a south-easterly direction 10 miles to the place of beginning.

Joe No. 13.

Commencing at a place located 200 feet to the east of a point on a path between the the north shore of the McKenzie River and an unnamed Indian village and being approximately 1/2 mile from the aforesaid north shore at which place a post has been located and marked in accordance with the regulations; thence in a north-westerly direction 10 miles to a point on the north shore of the McKenzie River; thence in a north-easterly direction passing through the Bluefish River 10 miles to a point; thence in a south-easterly direction again passing through the Bluefish River 10 miles to a point; thence in a south-westerly direction 10 miles to the point of beginning.

Joe No. 14.

Commencing at a place located 200 feet east of a point on a path between the north shore of the McKenzie River and an unnamed Indian village and being approximately one-half mile from the aforesaid north shore where a post has been placed in accordance with these regulations, such point also being the most southerly extremity of Permit No. 213 issued under these Regulations; thence in a north-

easterly direction 10 miles along the boundary of the aforesaid Permit to a point, such point also being the most easterly extremity of the aforesaid Permit; thence in a south-easterly direction 10 miles to a point; thence in a south-westerly direction 10 miles to a point on the north shore of the McKenzie River; thence in a north-westerly direction 10 miles to the place of beginning.

Joe No. 15.

Commencing at a place on the north shore of Sulphur Bay on Great Slave Lake where a post has been placed in accordance with these Regulations, such place being approximately one-half mile north of a small island located in Sulphur Bay; thence in a south-westerly direction 10 miles to a point; thence in a north-westerly direction 10 miles to a point located on a small unnamed river which flows into Sulphur Bay; thence in a north-easterly direction 10 miles to a point in Falaie Lake approximately one-half mile from the north shore thereof; thence in a south-easterly direction 10 miles to the place of beginning.

The area of the Company's holdings may be reached by aircraft, winter tractor road, or boat. Fort Providence is on the main ship navigation route into the north from the railhead at Waterways, Alberta. It is also fifteen miles east of the winter tractor road to Grimshaw, Alberta.

TOPOGRAPHY

The area is one of low relief, characteristic of gently folded Paleozoic sediments. There are few rock outcrops, making geological mapping difficult.

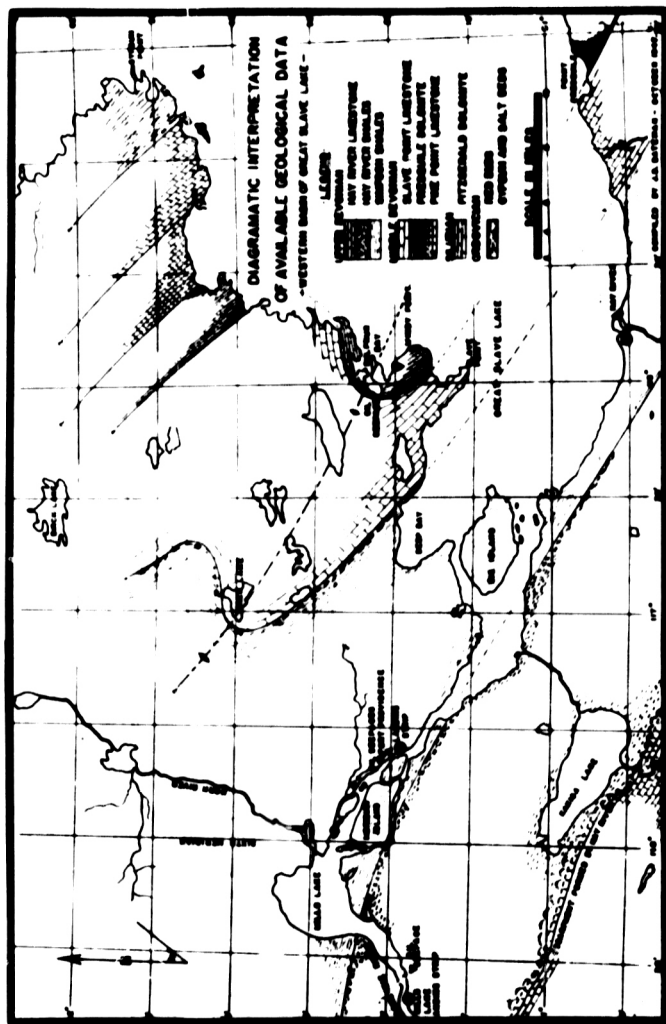
GEOLOGY

The geology of the Great Slave Lake area, after A. E. Cameron (1), G. S. Hume (2) and J. D. Bateman (3), is as follows:-

- (1) Summ. Rept., G.S.C., 1931 Part B, p.13.
- (2) Can. Inst. M. & N., Vol. 25, 1932, pp 92-103.
- (3) Western Miner, November 1947.

TABLE OF ROCKS

<u>Period</u>	<u>Formation</u>	<u>Thickness (In Feet)</u>
Cretaceous	Meander shales	—
Upper Devonian	Hay River Limestones	300
	Hay River shales	400
	Simpson shales	250
Middle Devonian	Slave Point limestone	200
	Presqu'ile dolomites	375
	Pine Point limestones	595
	Horn River shales	100
Silurian and Ordovician	Fitzgerald dolomites	275
	Red Beds (red shale, gypsum and salt)	595
Precambrian	Hard red sandstones	
	Granite	



These rock types are distributed approximately as shown on the accompanying "Diagrammatic Interpretation of Available Geological Data" after Bateman;

In assessing the suitability of the above rock types for petroleum exploration, the desirable essentials to consider, are

- (a) Presence of a suitably porous formation commonly of marine sedimentary origin.
- (b) Favourable rock structure, either as a secondary fold or primary reef structure.
- (c) An adequate impervious cover or cap rock.
- (d) Presence of oil, with or without abundant gas, of a viscosity that allowed its migration and concentration into pools.

Condition (a) above is believed fulfilled by the porous Middle Devonian dolomites and limestones. There is actual proof that this is the case, at least to a limited degree, by the oil seepages in the dolomites at Windy (Nintel) Point and in the limestones at Pine Point on Great Slave Lake.

Condition (b) above, as primary folding in the form of a north-west trending regional anticline in the Middle Devonian formation, has been mapped and is indicated on the accompanying geologic plan.

Condition (c) may be proved to be present with additional exploration. On the basis of the north-west plunge to the known anticline, and a regional dip to the south-west, it is reasonably assumed that the impervious Simpson or Hay River shales provide the required capping "down-dip" of the plunge and on the Rio Tinto property.

Condition (d) above is fulfilled at least to a limited degree. The presence of extensive petroleum distribution is established

by the present widespread oil seepages. Data as to the viscosity and presence of probable concentrations are not yet known.

CONCLUSIONS

The geological and structural conditions suitable for the presence of petroleum pools appear to be present on the holdings and proposed holdings of the Rio Tinto Alberta Oils Limited properties.

Petroleum is known to be present in the area of the Company's properties, as surface seepages.

The above conditions warrant an exploration program to learn if oil pools of economic importance are present.

RECOMMENDATIONS

- (1) Certain work requirements demanded by the "Permit to Explore" regulations governing establishment of boundary lines and corner posts should be complied with as soon as possible.
- (2) An aerial photographic study of the holdings should be undertaken for any geological or structural data it might provide.
- (3) Not less than \$30,000 be spent during the field season of ¹⁹⁵⁰ 1950 on a geophysical survey using either seismic or gravity meter methods. Such a survey might advantageously be supplemented with some standard size diamond drilling for additional geological and structural information.

- (4) The results from step (3) would determine if and where a well should be drilled with the best expectations of successfully finding a pool.

Respectfully submitted,

June 7th, 1950.
510-100 Adelaide St. W.,
Toronto, Ontario.

Franco. Jouhin
Franco. Jouhin,
Mining Geologist, and
P. Eng., Ont. & P.C.

A

B

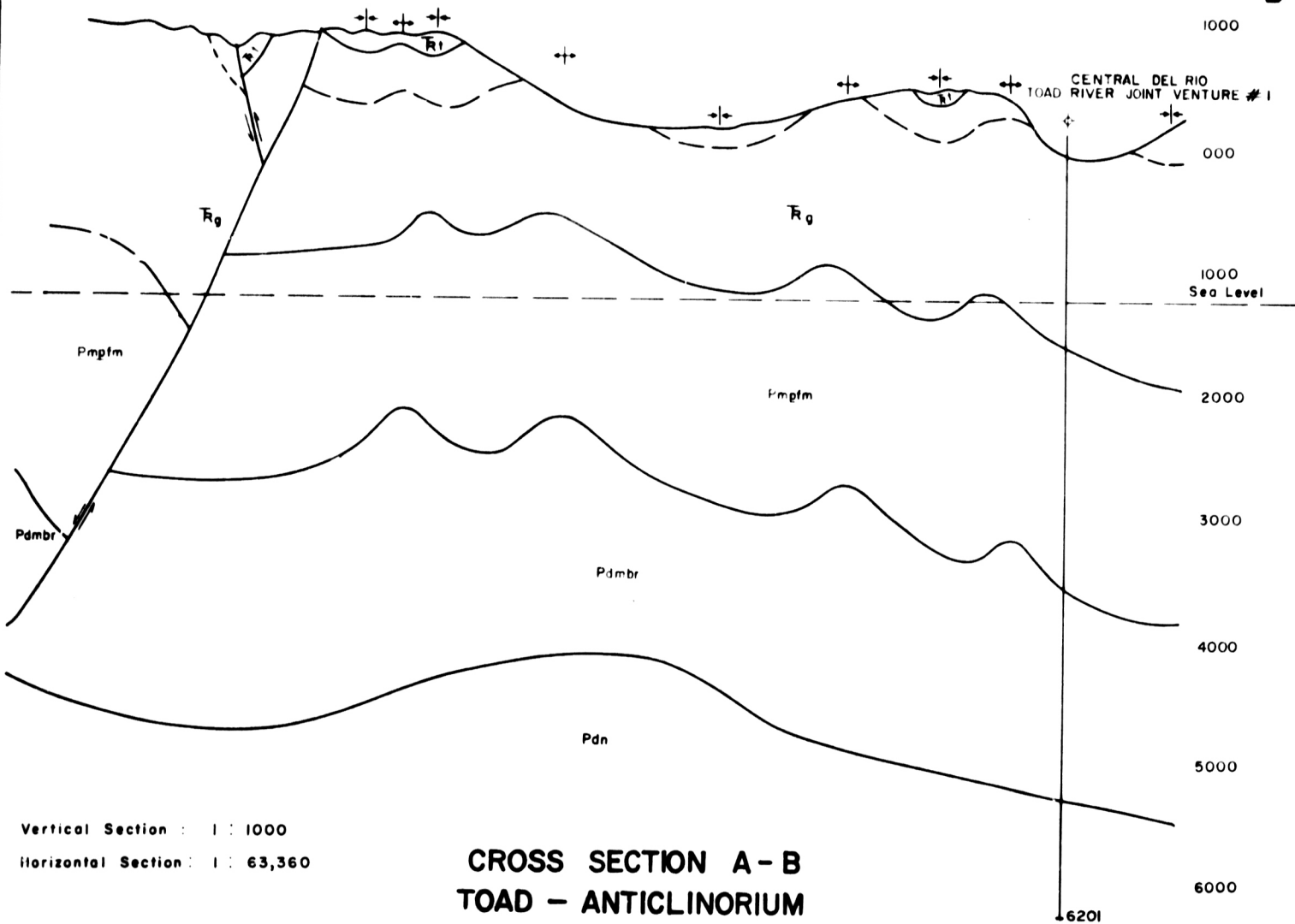
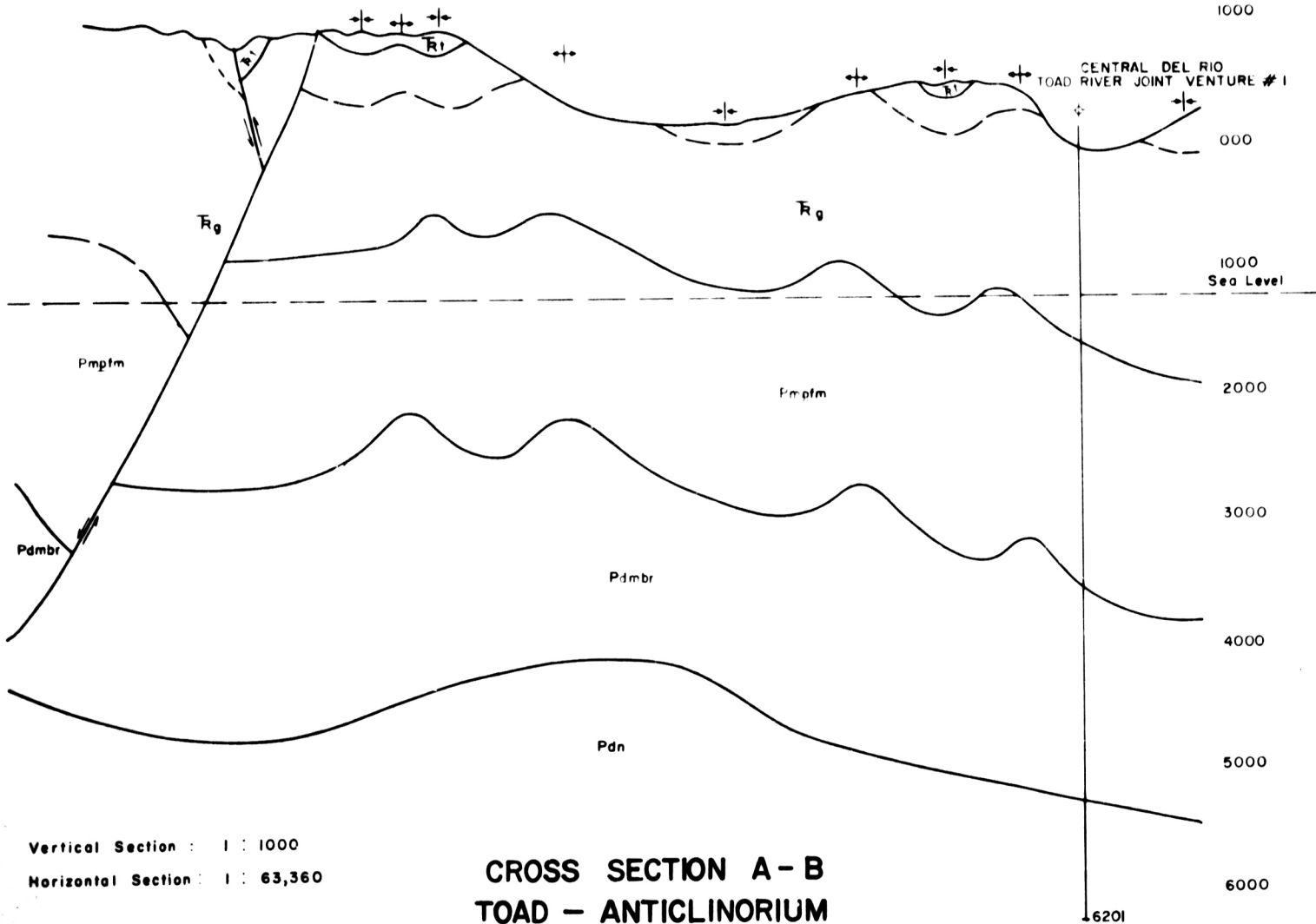


Figure 11

A**B**

CROSS SECTION A - B
TOAD - ANTICLINORIUM

A

B

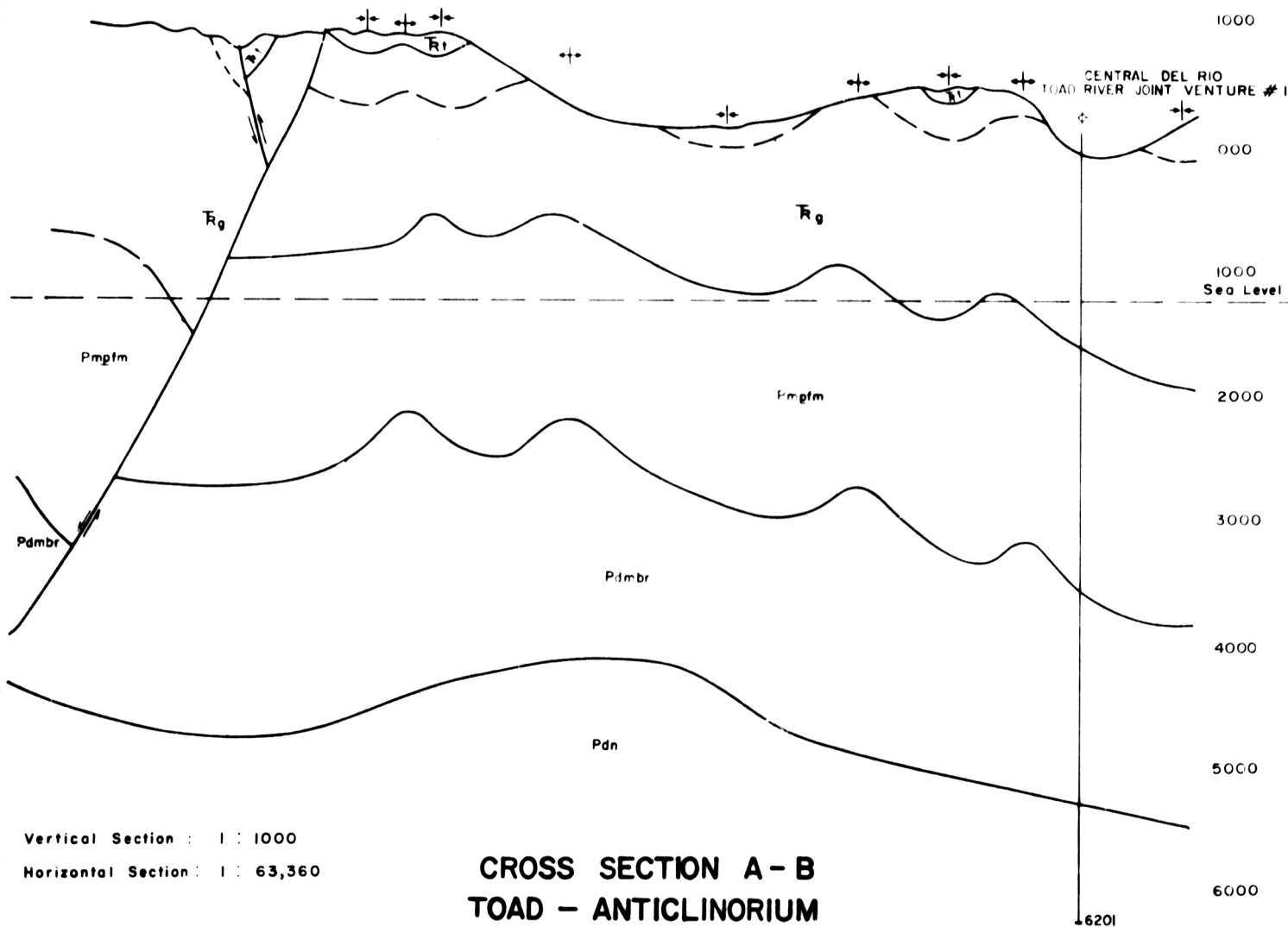


Figure II