

EXPLORATORY REPORT  
LIARD RIVER AREA - 1957

REPORT OF WORK COMPLETED UNDER EXPLORATORY LICENSES NOS.

207, 247, 248, and 272 to 281 inclusive

In compliance with Section 6 (a) to (d) inclusive of the Territorial Oil and Gas Regulations P.C. 1957 - 521, we submit the following report and enclosed plats in respect of the captioned exploratory licenses and work done under these licenses on land not held under permit or lease. This report covers the period from January 1956 to August 31, 1957.

During this period Shell Oil Company has completed or has caused to be completed geological and/or photogeological surveys within the areas outlined on the accompanying plat (1). In addition, a small amount of seismic work was done outside the boundaries of the Liard River permits and an aeromagnetic survey was in progress at August 31, 1957 which will cover the area shown on plat 1. During the course of this work no roads or airstrips were constructed and no aerial photographs were taken. The photographs used for the photogeologic studies were those taken by and purchased from Dominion Government agencies.

Shot holes drilled on and in the vicinity of permits held by Shell in the Liard River area are shown on the accompanying plat (2). No coal was encountered in any of these holes. The occurrence of sand, gravel and water is shown by symbols indicating the presence of these substances, the depth at which they were reached, and the thickness of sand and gravel penetrated.

Sedimentary rocks ranging in age from presumed Late Precambrian to Recent occur in the area covered. The consolidated sediments are



principally marine and in general limestones and dolomites predominate over shales and coarser clastics in amount.

In the more southerly part of the region the sedimentary sequence may be summarized as follows in descending order:

Cretaceous: shale, siltstone and sandstone; occurs on topographic highs in the region east of the mountains and in some broad, low valleys within the mountains.

Upper  
Devonian: principally shale and siltstone with limestone zones. In the Camell Bend region shales and siltstones occur both above and below the limestone; occurs mainly on the flanks of the mountains, and in the intramountain valleys, and on the lower parts of the plains east of the mountains.

Middle  
Devonian: principally carbonate, in part brecciated (Bear Rock formation), with some shale; upholds many of the mountain ridges and escarpments.

Lower  
Devonian: principally limestone; crops out at or near the core of a few anticlinal structures within the Canyon ranges between the North Nahanni and Redstone Rivers. This system of rocks had not previously been recognized in this region.

Silurian: principally dolomite; crops out on some of the structurally higher features of the Franklin Mountains and the Canyon Ranges and on some of the deeply incised rivers cutting across these mountains.



Ordovician: principally limestone and dolomite; distribution is about the same as that of the Silurian. At a few localities there are reddish shales and sandstones associated with some evaporites that are believed to belong to this system and to underlie the carbonates.

Cambrian: shale with limestone and sandstone interbeds overlying shale and sandstone; exposed on a few major uplifts in the Franklin Mountains, particularly Cap Mountain and Mount Clark.

Precambrian: Belt-type sediments, generally clastics of a reddish cast; exposed on Cap Mountain.

Most of the region covered is mountainous and is folded and faulted. Deformative stresses appear to have acted from the west. The northerly striking Franklin Mountains in the area discussed are anticlinal with a relatively steep east flank. In general they plunge north and south from Cap Mountain. Some 60 to 70 miles west of Franklin Mountains are the Canyon Ranges of Mackenzie Mountains formed of long, slightly sinuous, fairly closely folded, northwestward trending anticlines and synclines slightly overturned towards the east. Some of the anticlines appear to be bounded by faults along their eastern flanks. The country between the Franklins and Canyon Ranges is topographically lower and folded into broader, more gentle folds with northwestward trend.

In the northern region photogeology was supplemented by a brief reconnaissance carried out with the aid of a fixed-wing aircraft. This work indicates that approximately the same stratigraphic succession is present as in the southern area described above, and suggests that in addition



Carboniferous, Permian and Lower Mesozoic rocks may occur. The north striking Richardson Mountains appear to be upheld by an anticlinorium of very large dimensions in which older Paleozoic rocks are probably exposed at a regional culmination in the vicinity of the headwaters of Caribou River. The northwest trending British Mountains appear to be very closely folded with vertical dips common and faulting an important feature of the structure. In the area north of the Richardsons and between the Mackenzie Delta and Babbage River extremely complex faulting seems to be the pre-dominant structure.



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Enclosures - 2

*See letter  
of 19 Nov., 1957*











