

REPORT OF EXPLORATION ON LIARD RIVER AREA  
PERMITS 1008 TO 1015 INCLUSIVE WHICH ARE  
GROUPED WITH PERMITS 1019 TO 1027 INCLUSIVE

*FOR YEAR ENDING 1 AUG. 1957*

The following report is submitted in fulfillment of section 30 of the Territorial Oil and Gas Regulations.

30(1)(a) No aerial photographs were taken of the subject permits or the surrounding area.

30(1)(b) The permit area and surrounding plains region is underlain chiefly by sedimentary rocks of Devonian age. Certain topographically high areas are underlain by Cretaceous strata. To the west of the permits the Nahanni range exposes Devonian sediments. The beds of the plains region are nearly flat lying or only gently folded, the beds of the mountains are folded and faulted and a major thrust or high angle reverse fault is believed to occur at the boundary of the two topographic divisions.

The sedimentary column of the plains portion of the region is known from scant surface exposures and a few drill holes. In descending order it is as follows:

Cretaceous Shales with minor amounts of sandstone and siltstone; generally grey to buff in colour; marine to brackish; sparsely fossiliferous (inoceramus); dips generally flat; 1,000 feet thick ?

Upper Devonian Hay River Shale. Greenish grey shale, soft, fissile; minor amounts of siltstone interbedded as at Liard Rapids; both shale and siltstone slightly calcareous to calcareous. Generally dips southwestward at about 30 feet per mile. 2,900 feet thick at H.B.-B.A. Lone Mountain No. 1.

Hay River Limestone. Grey, fawn-weathering, thick bedded limestone; fossiliferous, with fossils indicating correlation with the Grumbler formation; dips southwestward at about 30 feet per mile; thickness estimated at 1,000 feet on very scant evidence

Middle Devonian Fort Creek Shale or Horn River Shale. Dark brown to black shale with dark brown streak, bituminous. Thin bedded and fissile. Averages 100 feet thick. Exposed at one locality on Liard River.

Ramparts formation. Limestone, thick bedded, light grey, fossiliferous; 200 to 300 feet thick. Not exposed. Intersected at bottom of Shell, Liard River No. 1.

Bear Rock formation. Limestone and/or dolomite with some anhydrite and/or gypsum, grey. Generally thickly and



poorly bedded. More or less cavernous. West Territories, Westerol 3A encountered salt which may belong to this formation. In the plains region the thickness has not been determined; in the mountains the thickness is at least 2,000 feet.

Silurian and Ordovician Rocks of this age do not crop out in the mountains immediately west of the Liard River Area nor have they been identified with certainty in any of the drill holes in the neighbourhood. The salt referred to above may be Silurian or Ordovician in age as Ordovician salt is known in the Mackenzie Mountains southwest of Norman Wells. Some reddish arkosic beds penetrated near the bottom of West Territories, Westerol No. 3A are quite probably Ordovician in age.

Precambrian Precambrian rocks may have been reached in the last few feet of drilling in Westerol 3A. Otherwise they are not known in the Liard River area.

In the Nahanni Range Bear Rock is exposed on the eastern face of the mountains. Ramparts formation caps the crest of the range and covers the western dip slopes.

There are no structures that can be delineated in the plains on the basis of outcrops. However, the Fort Creek outcrop on Liard River in Permit 1013 suggests an uplift in this vicinity.

There is no exposure of the fault which is believed to occur at the boundary between mountains and plains, its presence being inferred from the relationship of folded to unfolded rocks and the juxtaposition of Middle and Upper Devonian rocks along the mountain front. In general the beds in the Nahanni Range dip west at about 40°. But in the vicinity of the headwaters of Grainger River there is an anticlinal fold with limb dips of about 40° to east and west.

An aeromagnetic survey is in progress at this date. It covers a portion of the captioned group of permits near their northern end. No results have been received as yet from the contractor so that this work cannot be reported upon.



R.A. Brown  
District Geologist  
Northwest Territories District  
Shell Oil Company

RAB:kw.

Enclosures





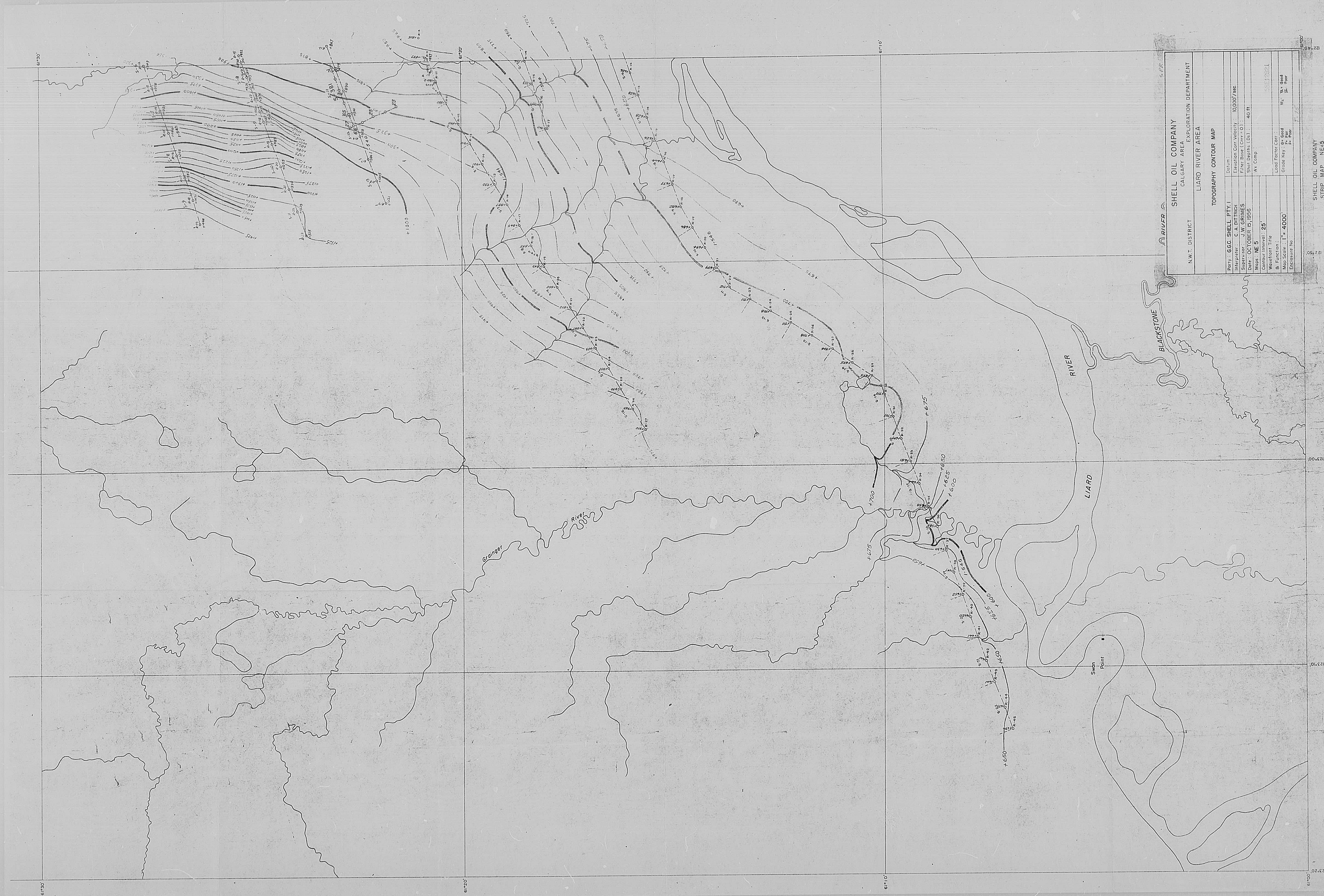
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|--------------------------|----------------------------------------------------|
| SHELL OIL COMPANY        |                                                    |
| CALGARY AREA             |                                                    |
| EXPLORATION DEPARTMENT   |                                                    |
| LIARD RIVER AREA         |                                                    |
| TOPOGRAPHY CONTOUR MAP   |                                                    |
| Part: 66C, SHELL PTY. I  | Scale: 1" = 4000'                                  |
| Prepared by: J.W. CRIMES | Sheet Dimensions (D): 40 ft                        |
| Date: OCTOBER 15, 1956   | W. Comp.                                           |
| Mass: NE 7               | Contour Interval: 25'                              |
| Waterfront Title         | Load Factor Code                                   |
| Map Scale: 1" = 4000'    | Grade Key: 1. Poor, 2. Fair, 3. Good, 4. Very Good |
| Enclosure No.            |                                                    |

