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# SUMMER SEISMIC PROGRAM, 1961
# WRIGLEY AREA, NORTHWEST TERRITORIES

Shell Oil Company of Canada, Limited
November, 1961

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# WRIGLEY AREA, NORTHWEST TERRITORIES
# SUMMER SEISMIC PROGRAM 1961
# PERMITS 1016 - 1018 INCLUSIVE AND PERMITS 3204 AND 3205

Persuant to Section 54, (1), (2), b, of the Canada Oil and Gas Land Regulations the following is reported in regard to a geophysical exploration program carried out on the subject permits and surrounding area.

## 1. Location

The Wrigley area lies about 20 miles southwest of the airstrip at Wrigley, Northwest Territories. Work was carried out between latitudes 63° 07' N and 63° 14' N and between longitudes 123° 58' W and 124° 17' W.

## 2. Dates of Survey

Field operations were conducted between August 1st and August 14th, 1961, for a total of 14 working days. The drilling and brush-cutting took 9 1/2 and 12 days respectively and the recording required 3 days. This helicopter operation followed the survey in the Many Beavers area.

## 3. Field Operations

### (a) Surface Outcrops

Surface formations consisted of deposits of glacial till, sand, gravel and muskeg with the underlying formation of the Paleozoic age frequently exposed.

### (b) Type of Terrain

Elevations ranged from about 1,150 feet to 2,600 feet above sea level.

The terrain was quite rugged and covered with moderate to heavy timber. The topography had been influenced by various streams flowing east into the Mackenzie River.

(c) Weather

Typical summer weather prevailed throughout the period of survey. The drills and brushcutters lost two days because of rain.

(d) Drilling

Holes were generally drilled to a depth of 50 feet through the surface clay or gravel and into hard shale or sandstone. Drilling equipment consisted of two Mayhew 50 portable drills. Portable water pumps made by Gorman Rupp were used to provide circulation of mud. Bits were of both the insert and 3 cone rock types. Bit size commonly used was 3 1/8 inches. Some difficulty was encountered in drilling through hard ledges of sandstone and with the surface gravel and boulders.

(e) Recording

(i) Layout

Seismic surveying was performed using the continuous profile method. A shotpoint was located at the centre of a 6,900 foot instrument spread with 24 seismometer stations spaced 300 feet apart and with the distance from the shot-point to the closest station being 150 feet. Two seismometers spaced 5 feet apart were located in each station. The one refraction profile also utilized a 6,900 foot instrument spread as above.

(ii) Charge and Depth

The normal charge in the reflection shooting was 50 pounds at average depth of 35 feet. The one refraction shot utilized a charge of 100 pounds.

(iii) Instruments

General Geophysical Model JMH amplifiers were used and no tape system was employed. Electrotech 20 cycle marsh seismometers were used at each recording station.

(f) Surveying

Surveying was performed using a Wild T1A theodolite in establishing the vertical and horizontal control. The origin of this control was government survey station LOW situated northwest of the reflection profile.

The horizontal intervals between the stations and between the shotpoints were established by means of a chain.

Some discrepancy was noted insofar as the positions of the shotpoints were concerned. The positions as calculated from the government station did not agree, when plotted with the known topographical features. The locations were finally adjusted on the maps to conform with the topographical features.

(g) General

The equipment utilized and the field methods employed during this survey were essentially the same as discussed in the report submitted for the helicopter operation in the Many Beavers area dated November, 1961, with the exception of the following small differences:

(i) Camp

Scarcity of useable lakes in the area and the short duration of the working period necessitated placing the camp at the settlement of Wrigley and flying the crew by helicopter to the field daily, a one way distance of about 20 air miles.

(ii) Brushcutting

The scarcity of water near each shot point necessitated the hauling of water in ten gallon kegs on the side of the helicopter. This method was found to be superior to the use of a sling loaded 45 gallon drum. ~~The~~ Two Mayhew 50 drills were used and tours ~~which~~ began at daybreak and stopped at nightfall.

(iv) Recording

This area was shot with split continuous profiles. This required one man for each of two portable cables used on each half spread and one man to carry the marsh type seismometers. Planting the seismometers required extra time and at times additional men were used to speed up this part of the operation.

4. Computations

All traces were corrected to an elevation datum of 1,800 feet above sea level using a correction velocity of 8,000 feet per second.

Weathering corrections were calculated at each shot point and interpolated for each station. Since the first breaks were rather poor, weatherings were calculated using the formula:

$$Wcp = \frac{\text{Hole depth}}{8{,}000' \text{per sec.}} - \text{uphole time}$$

5. Maps

The following maps are submitted with this report:

- Topography
- Devonian - time structure map.

Prepared by Northern Division Geophysical staff, J. Hamilton Division Geophysicist under the supervision of B.M. Veilleux, Northern Division Exploration Manager, Shell Oil Company of Canada, Limited, December, 1961