

**REFLECTION SEISMOGRAPH SURVEY OF THE PEEL PLATEAU AREA**  
**YUKON AND NORTHWEST TERRITORIES**  
**FOR SHELL CANADA LIMITED**  
**SUMMER 1964**

**SHELL CANADA LIMITED**  
**Northern Division Exploration**  
**Edmonton, Alberta November, 1964.**



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#### ENCLOSURES

- not included*
1. Near top of Middle Devonian (Base of Canol)
  2. Lower Paleozoic (Cambrian)
  - ✓ 3. Surface Elevation.

**FOREWORD**

**REFLECTION SEISMOGRAPH SURVEY OF THE PEEL PLATEAU AREA**  
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Permits: #1232, #1233, #2428-2433 inclusive, #3406-3412 inclusive, #3456-3461 inclusive, #3490-3505 inclusive, #3572-3576 inclusive, 3602-3617 inclusive.

In compliance with Section 54 (1), 2(b) of the Canada Oil and Gas Land Regulations the following is reported with regard to a geophysical exploration program performed on the subject permits and surrounding area.

The geophysical survey was conducted by Ray Geophysical Company, a division of Mandrel Industries Incorporated.



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**LOCATION:** 65°40'N. - 66°33'N., 133°21'W - 135°27'W.

Adjacent towns: The area is located approximately 86 miles south of  
Fort McPherson, N.W.T.

**DATE OF SURVEY:**

From June 18, 1964, to September 3, 1964.

Number of working days in field: 56.

**EXTENT OF SURVEY:**

Approximate Acreage Surveyed: 1,638,400.

Miles of Traverse: 227½

Number of Profiles: 546

Number of shot holes: 736

**FIELD CONDITIONS:**

**Surface Outcrops:**

Cretaceous formations outcrop east of a line running from  
134°20'W., 66°00'N to 135°40'W., 66°52'N. West of this line outcrops of  
Triassic, Mississippian, Devonian, Silurian and Ordovician were noted.

**Type of Terrain:**

Elevations ranged from 100 feet above sea level near the Peel  
River to 2500 feet above sea level near Caribou Mountain. The entire area  
worked is drained by a dendritic pattern of streams into the Snake and Peel  
Rivers.

### Available Roads or Water Routes:

There are no available roads within or near the area. The area is accessible in the summer by float equipped aircraft, rotary-winged aircraft and river transportation.

### Weather:

Temperatures averaged near 60°F. during the work period. Approximately thirteen days were lost due to rain and fog. Snow was encountered on occasion on the higher plateaus.

### FIELD PROCEDURE

#### Drilling:

##### (a) Formations:

Most holes were drilled in permafrost. Near surface geologic formations were logged as shales and clays. Gravel and boulders were encountered on several plateaus and near creek beds.

##### (b) Hole Depths:

The average hole depth for the area was approximately 40 feet.

##### (c) Casing, Charge Anchors etc.

No casing was used. No charge anchors were needed.

##### (d) Drilling equipment.

3- Modified Sewell Auger water drills

2- "Standby" Carey Water drills

1- Sikorsky S-58 helicopter

3½" Varel Insert Bits

3½" Varel Rock Bits

7- 3½" - 4-way inserts were tried but proved unsuccessful.



**(e) Drilling Problems:**

Due to surface gravel or clay and boulders, the drill was unable to complete all shot holes to the required depth of 50 feet. In these cases an attempt was made to drill and load two shallow holes.

Some shot holes were not loaded to total depth because of shot hole caving. This occurred when rough drilling was encountered and the prolonged drilling time resulted in excessive thawing of the bore hole walls.

In a few instances, the drill was unable to make sufficient hole in a reasonable time due to hard rock at the surface. A heavier drill would overcome this problem.

**Recording:**

**(a) Type shooting, Spread Length, Shooting Distance, Seismometer Interval, Etc.**

A 5,280 foot split-continuous spread with shot points 2,640 feet apart was employed. Two 13-trace 220-foot station interval cable with 6 seismometers per trace, spaced 25 feet apart, were used. A spread diagram can be found on the following page.

**(b) Influence of Hole Depth:**

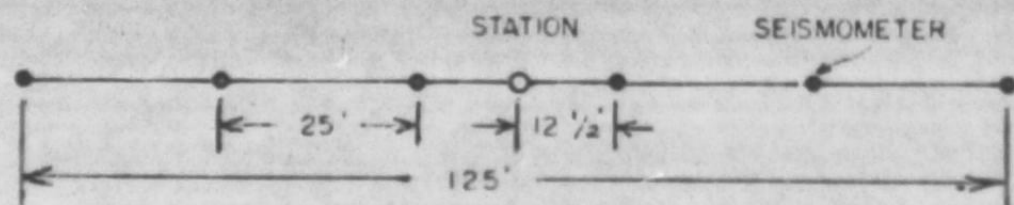
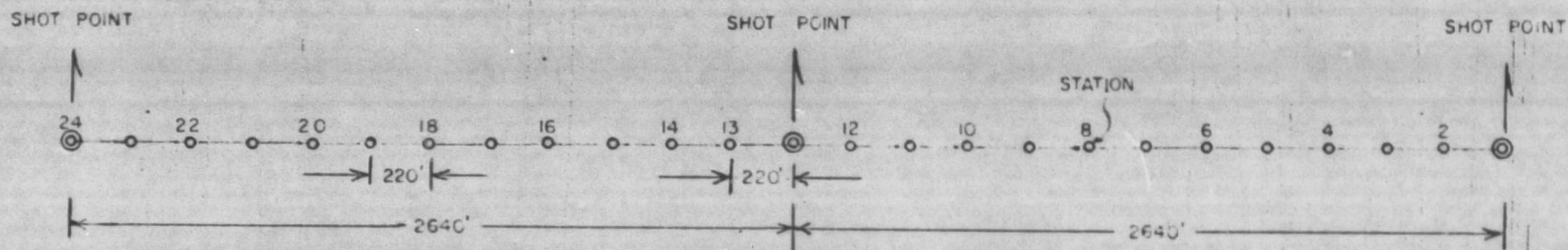
A minimum hole depth of 30 feet was found to be necessary to ensure record quality requirements.

**(c) Charges:**

Charge size along with hole depth proved to be critical. A minimum of 45 to 50 pounds was required to ensure adequate record quality.

# PEEL PLATEAU AREA

## SPREAD LAYOUT





**(d) Type of Instruments:**

**Amplifiers:** General Geophysical Company "J.M.H."

**Magnetic Recorder:** General Geophysical Co. "Geocord"

**Seismometers:** Electro-tech - 27 cycle frequency "EV-15"

**Base Filter:** 1-25-75.

**(e) Transportation:**

1 Bell G-3B helicopter.

**Surveying:**

The survey crew consisted of 3 surveyors and 2 rodmen. Two surveyors directed the brush cutters and conducted the survey while the third surveyor worked survey notes. Two Wild T-1A theodolites and a 220-foot chain were used for surveying. Horizontal and vertical control was based on triangulation stations in the area, Tellurometer stations, celestial observations and a previous survey conducted during the winter of 1962-63. A Bell G-3B helicopter was used for transportation of surveyors and brush cutters.

**OFFICE PROCEDURE:****Weathering Correction:**

The uphole delay time method of computing weathering corrections was employed. These corrections were made to a 10,000 feet per second velocity.

$$Dt: Tuh - \frac{Ds}{10,000}$$

$$Wxc: -Dt$$

**Elevation Correction:**

A velocity of 10,000 feet per second was used to correct to a datum of 1,000 feet above sea level.

**Other Corrections:**

A shot point correction was obtained by adding algebraically the break correction, uphole time, weathering delay time and elevation correction. The trace corrections were obtained by adding the weathering delay time and the elevation correction. Total corrections for each trace were obtained by adding the shotpoint correction to the respective trace correction.

Tape corrections for variable area cross-sections were obtained by using the above total corrections less the respective break correction.

These cross-sections were used primarily to assist in correlation of events. Datum values were obtained directly from the seismic field monitor records.

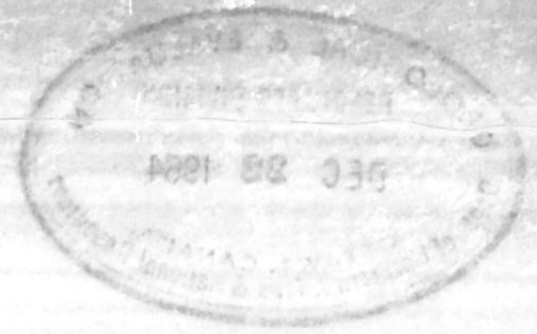
**RESULTS:**

Record quality varied from very poor to good but generally may be considered as fair.

The following maps are being submitted:

- (1) Near top of Middle Devonian (Base of Canol)
- (2) Lower Paleozoic (Cambrian)
- (3) Surface Elevation.





**Prepared by Northern Division**

**Exploration - Geophysical Section**

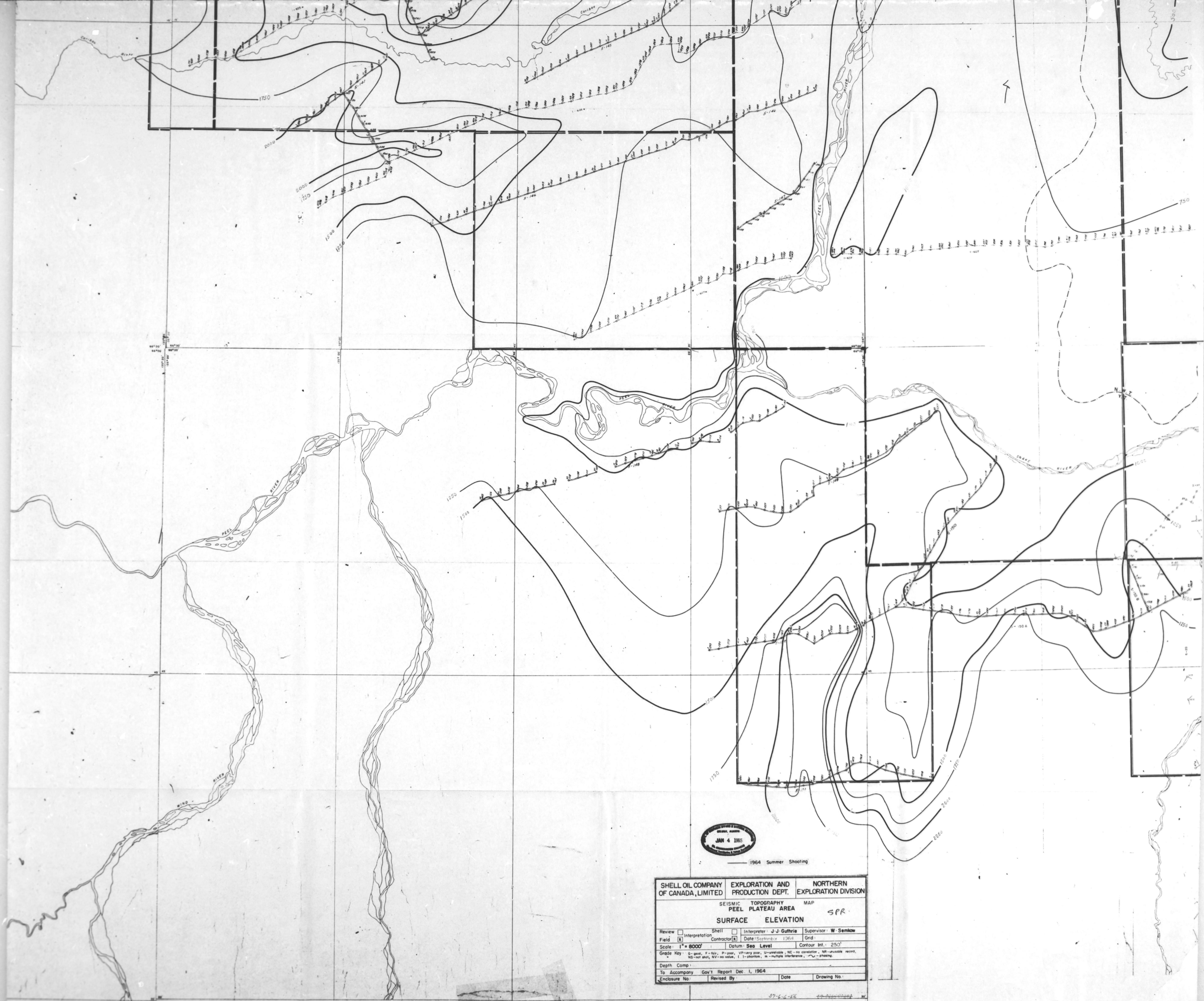
**under the supervision of Fred A. Kidd,**

**Manager, Northern Division Exploration,**

**Shell Canada Limited, November 1964.**



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