

GEOPHYSICAL REPORT ON THE
ALEXANDRA AREA
NORTHWEST TERRITORIES 1962-63

Shell Canada Limited
Southern Division Exploration
Edmonton, Alberta October, 1963



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GEOPHYSICAL REPORT ON THE ALEXANDRA AREA
NORTHWEST TERRITORIES

Permits #976, 977, 979, 980, 1572, 1573, 1531, 1532, 1528, 1529, ~~2122~~, 2661, 2662, and 2663.

In compliance with section 54 (1) and 2 (b) of the Canada Oil and Gas Land Regulations, the following is a summary of the geophysical work done by Shell Canada Limited in the aforementioned permit area during 1963.

Location:

Alexandra Lake Area, approximately located between the latitudes of 60°00' and 60°30' North and between longitudes 118°20' and 119°20' West.

Dates of Survey:

Seismic activity started with dozing between February 1 and April 10 1963. The drills were operating between March 17 and April 6, 1963. Seismic recording was conducted between March 20 and April 10, 1963.

Extent of Survey:

Miles of Traverse: 85

Number of profiles: 195

Field Conditions:

1. Surface outcrops

Surficial deposits of sand, gravel and muskeg were noted.

2. Topography

Along the south of the area elevations were between 2000 and 2200 feet at the Territories border. In the north, near the Kakisa River, elevations dropped as low as 950 feet.

3. Access roads

New seismic lines were cut by the dozers throughout except for about 24 miles between Shell Kakisa No. 2 and Shell Alexandra No. 7.

4. Weather

Warm weather was approaching (daytime $+45^{\circ}$) but cold nights (0° to -10°) prevented serious thawing. The recording crew was forced to shut down for a one day period due to blizzard conditions.

Field Procedure:

A. Drilling

1. Formations: Formations encountered during drilling included gravel, sand, clay and muskeg. Clay and boulders were logged in a large portion of the holes drilled.
2. Hole Depth: The hole depth was 40 feet in almost every case.
3. Charge Size: A five (5) pound charge was used throughout.
4. Casing: No casing of holes was required.
5. Drilling Equipment: Drilling equipment consisted of two Sewell augers, truck mounted, supplied by subcontractor Kuntz and Associates, and one Failing CFD18, truck mounted, supplied by H. Clay. The latter used water circulation.
6. Drilling Problems: No drilling problems were encountered.

B. Recording

1. Procedure:

A 24 trace recording unit was used with even number shotpoints split recorded into 200 foot station intervals from 200 to 2,400 feet. Shotpoints were 2,600 feet apart. Odd number shotpoints were shot as 5,000 foot

enders (with a 2600' station missing) in both directions (2 shots). This type of shooting gave a 50% subsurface coverage overlap.

2. Recording equipment.

Detection was with eight seismometers at intervals of 15 feet per station. These seismometers were manufactured by Electrotechnical Laboratories (type EVS 2).

Shell seismic amplifiers (type AG6A) were used, with a Shell filter setting of 543, and automatic volume control.

Simultaneous recordings were made on conventional (12 inch) paper records and magnetic tape. The magnetic tape unit was an S.I.E. (type TFM-3) frequency modulated recorder.

Traces numbered 1 to 24 were recorded from the corresponding stations on the instrument spread. Energy from stations 13 to 17 also by passed the automatic volume control portion of the amplifiers and was recorded on separate constant sensitivity traces on the monitor records. A step function filter response was recorded at the beginning of all traces on the monitor records. The shot break and uphole were recorded on traces 4 or 6 of the monitor records as well as traces 25 and 26 of the magnetic tapes. A 100 cycle per second timing signal (derived from a tuning fork) was presented as timing lines on the monitor records and also recorded on trace 27 of the magnetic tape. Occasionally galvanometer playbacks were made from the magnetic tapes. The monitor records were recorded at a speed of 10 inches per second. The magnetic tapes were recorded at a speed of $7\frac{1}{2}$ inches per second.

3. Shotpoints

Single holes loaded with 5 pound charges at a depth of 40 feet was considered optimum and used throughout the survey.

C. Surveying

Surveying was performed using one Wild T1 theodolite, and one Gurley instrument. Spreads were laid out using a calibrated chain. Vertical and horizontal controls were obtained from Survey Monument #359 on the Alberta, Northwest Territories boundary. Survey ties were made to wells Shell Kakisa No. 2 and Shell Alexandra No. 7. Vertical ties were also made to old seismic shotpoints used in 1959-60 by Socony Mobil Oil of Canada Ltd.

Interpretation

1. Datum Correction:

A datum of 2000 feet above sea level was chosen and all elevations corrected to it by use of an elevation correction velocity (Vce) of 6500 feet/sec.

2. Weathering Correction:

Uphole weathering ($-Tuh / Ds/Vce$) only was used.

Tuh uphole time
Ds depth of shot
Vce replacement velocity = 6500 feet/sec.

The total corrections (sum of elevation corrections and weathering corrections) were applied to the magnetic tapes after they had been transcribed to DS-7 direct recorded tapes. The DS-7-1 (Serial 723) tape recorder manufactured by Electrotechnical Laboratories, operates a stepout removal cam system which was chosen for the area. Due to large variations in the elevations it was difficult to set the cam for adequate stepout removal all the time. The cam,

designed for 24 trace symmetrical split recording, forced the necessity of selecting 12 near traces from the two ender tapes recorded at the odd numbered shotpoints and recording them as a normal split tape.

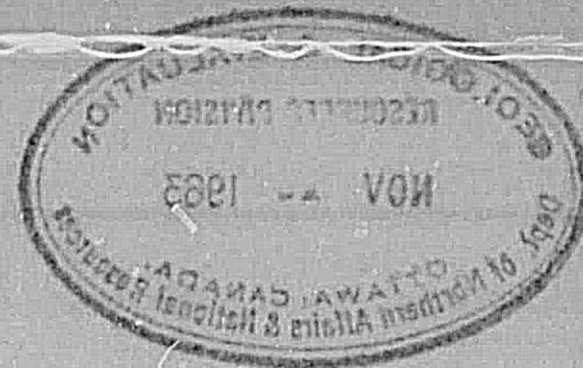
Maps Submitted

Topography

Top Hay River Lime (time structure)

Top Slave Point (time structure)

Top Hay River Lime to Top Slave Point (time isochron).



W. Veilleux

Prepared by Southern Division

Exploration - Geophysical Section

Under the supervision of B.M. Veilleux,

Manager Southern Division Exploration,

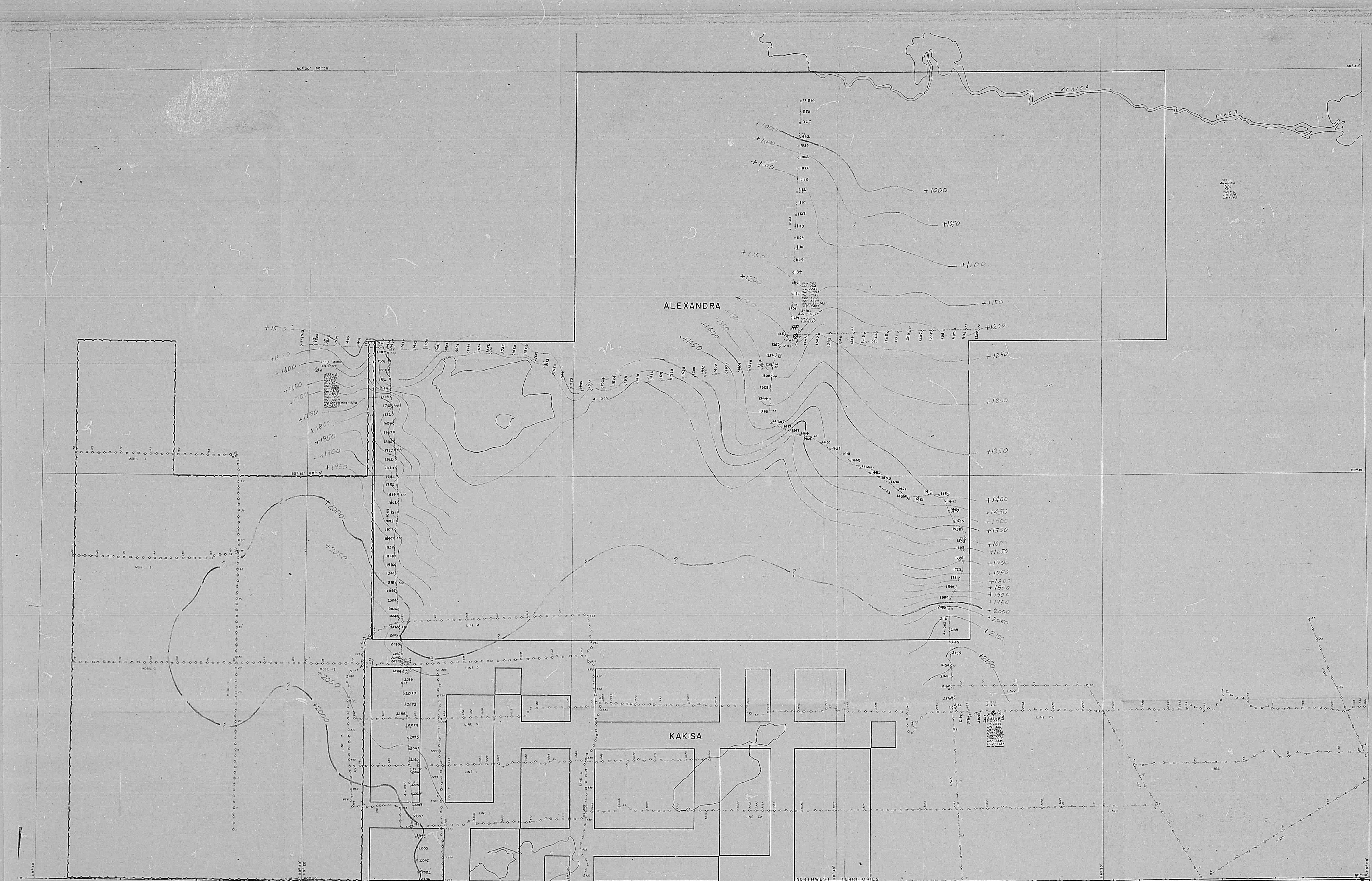
Shell Canada, Limited.

October, 1963.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35

WEST CANADIAN GRAPHIC INDUSTRIES LTD.

30x



SHELL OIL COMPANY
OF CANADA, LIMITED
STRIP MAP NO 3-4
SCALE 1" = 8000'
JAN. 1963
S.V.L.

ND 1-5

XF-15

SHELL CANADA LIMITED		EXPLORATION AND PRODUCTION DEPARTMENT		SOUTHERN EXPLORATION DIVISION	
TOPOGRAPHY: 50'					
Party: SHELL No. 4		Datum:			
Interpreter: P. P. THORPE		Elevation Corr. Velocity:			
Supervisor: D. W. SMITH		Filter Base (Corr = 0):			
Date: OCT 15 1963		Shot Depths (DS):			
Maps:		Wk. Comp.:			
Contour Interval: 50'		Lead Factor Corr.:			
Waveform Title:		Grade Key:			
B. Function:		Map Scale: 1" = 8000'			
Map Scale: 1" = 8000'		Enclosure No: 1			
To accompany: Government Report.		NOV 26 1963			

Map - Alexandra Area

Topography

Top Bay River Line (time structure)

Top Slave Point (time structure)

Top Bay River Line to Top Slave Point (time isochron)