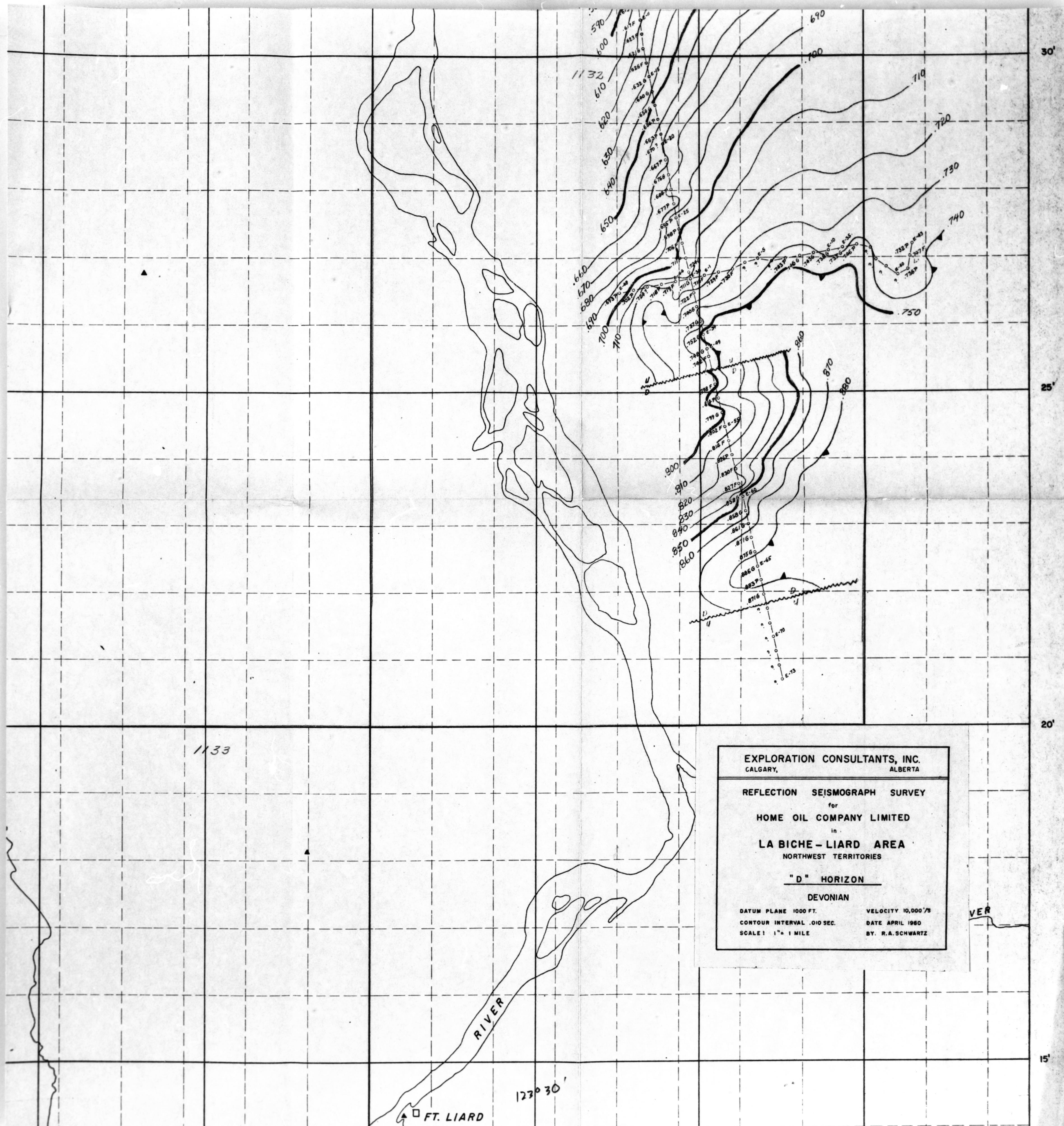
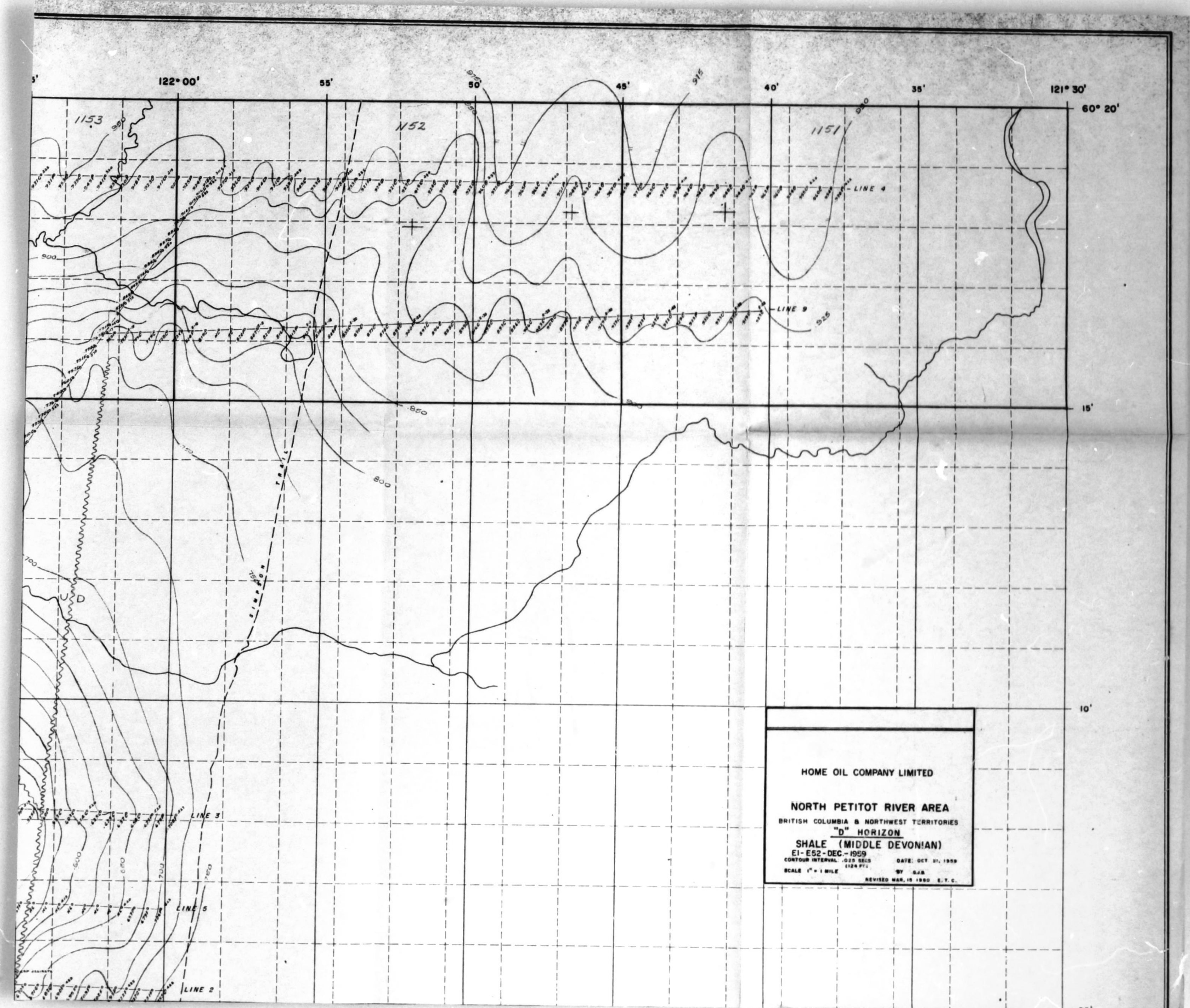
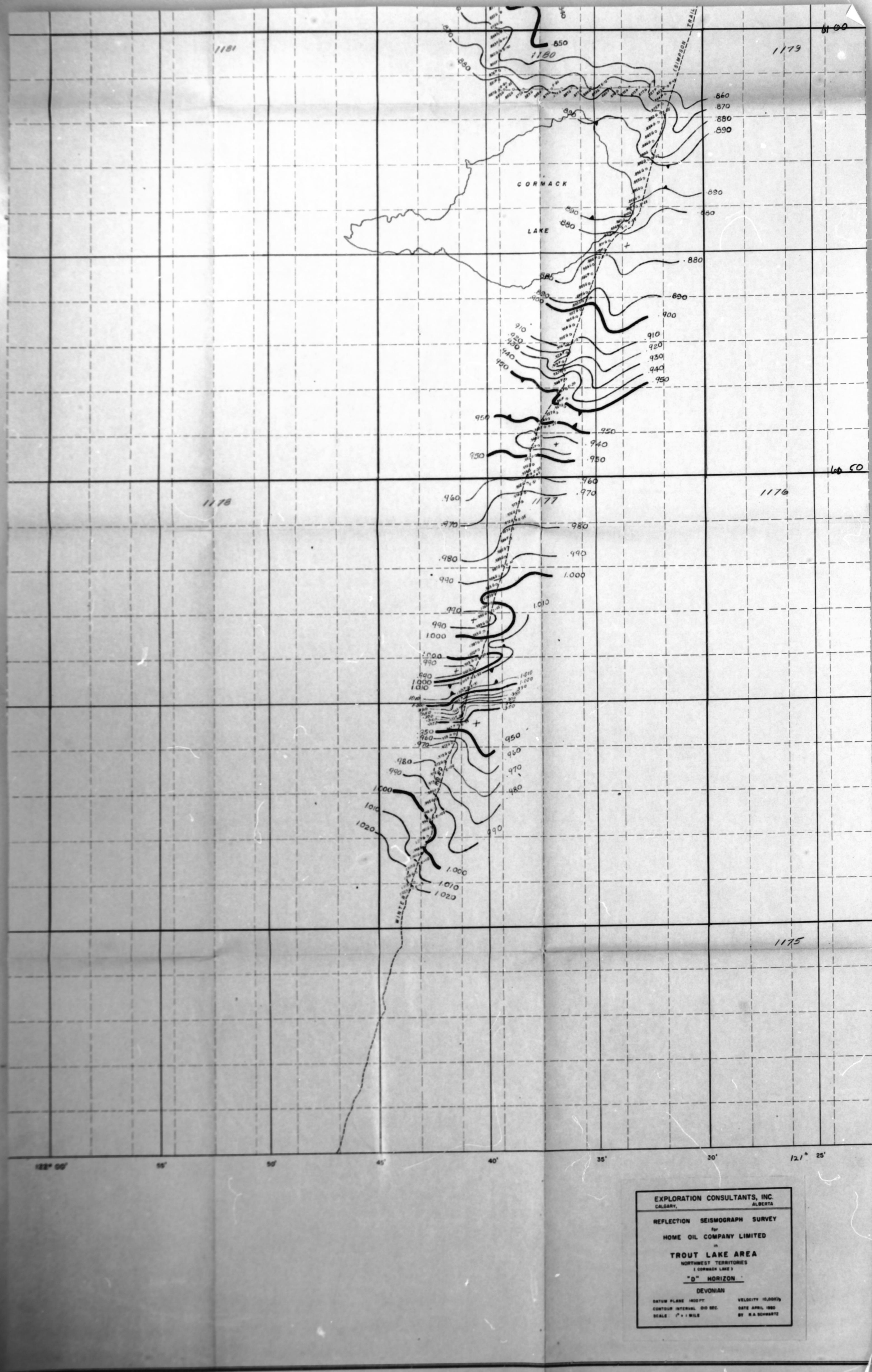
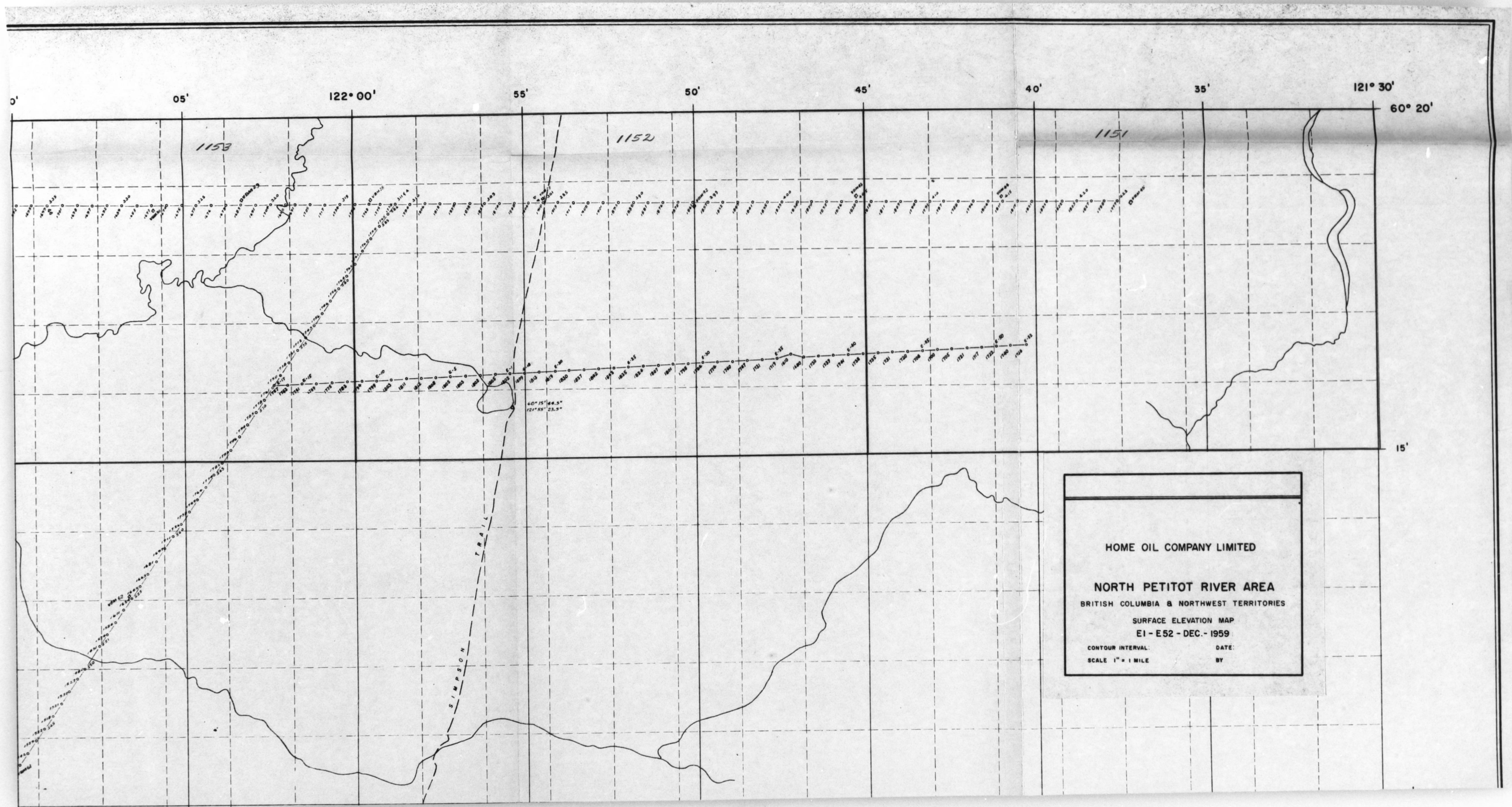


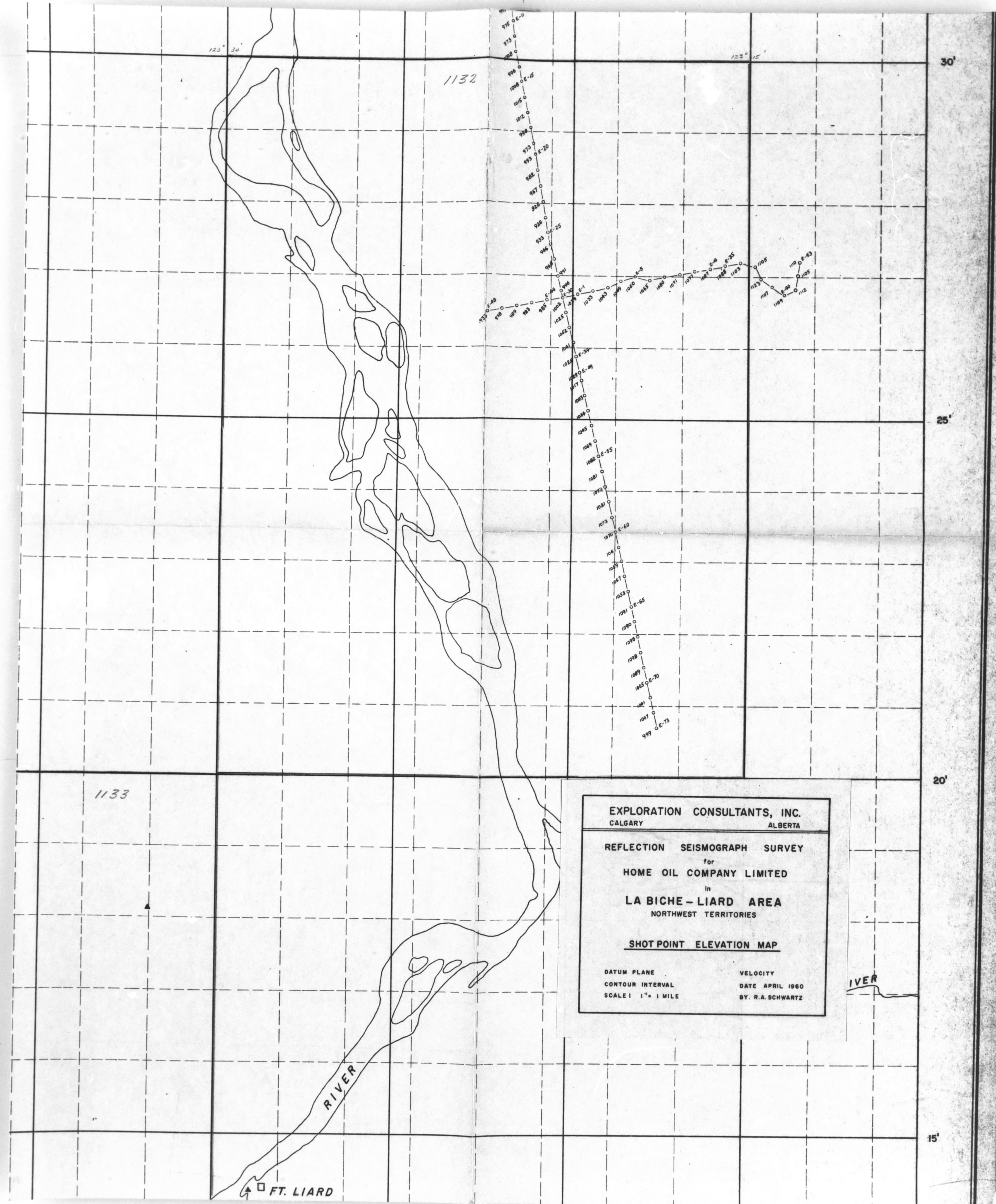
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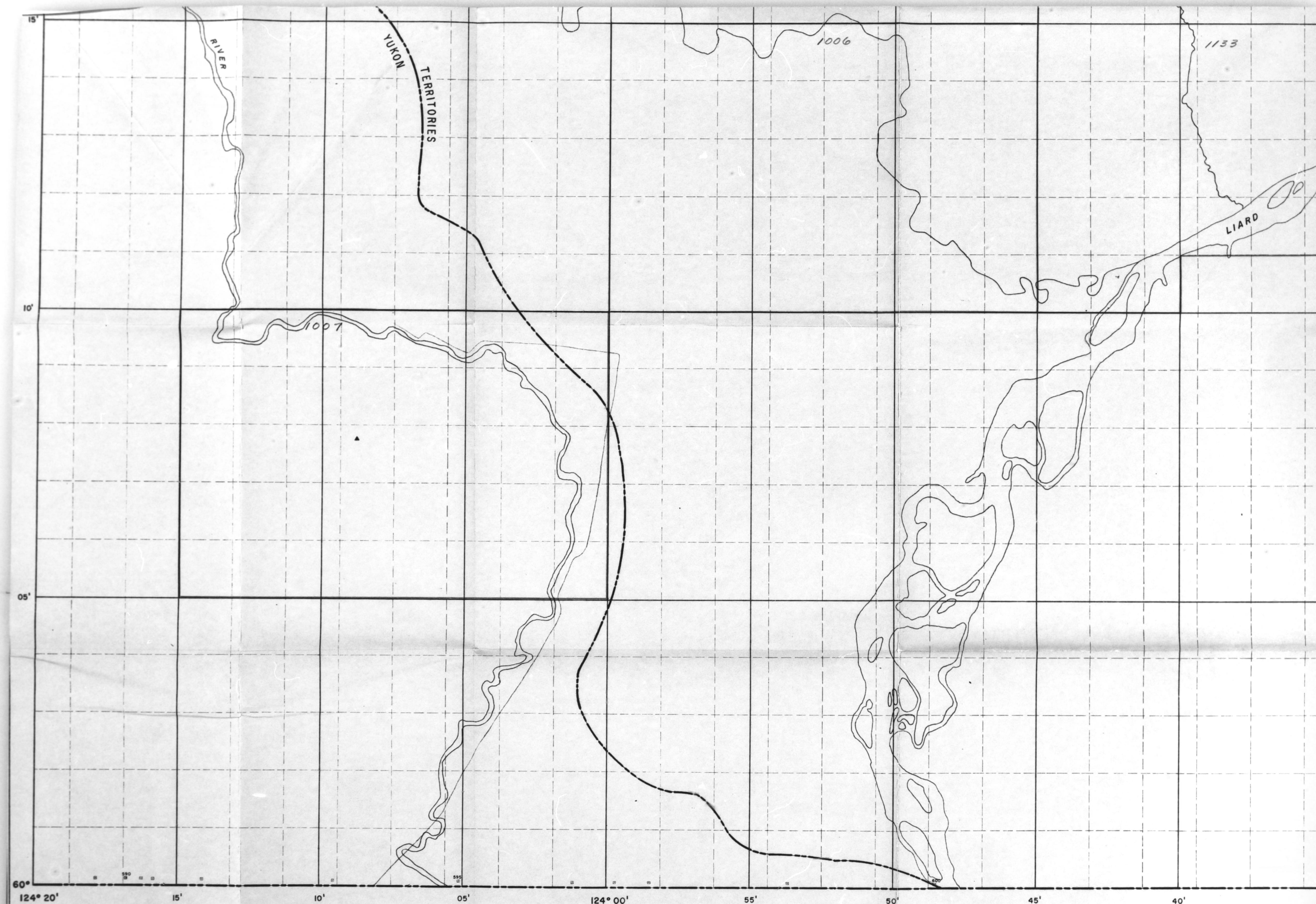








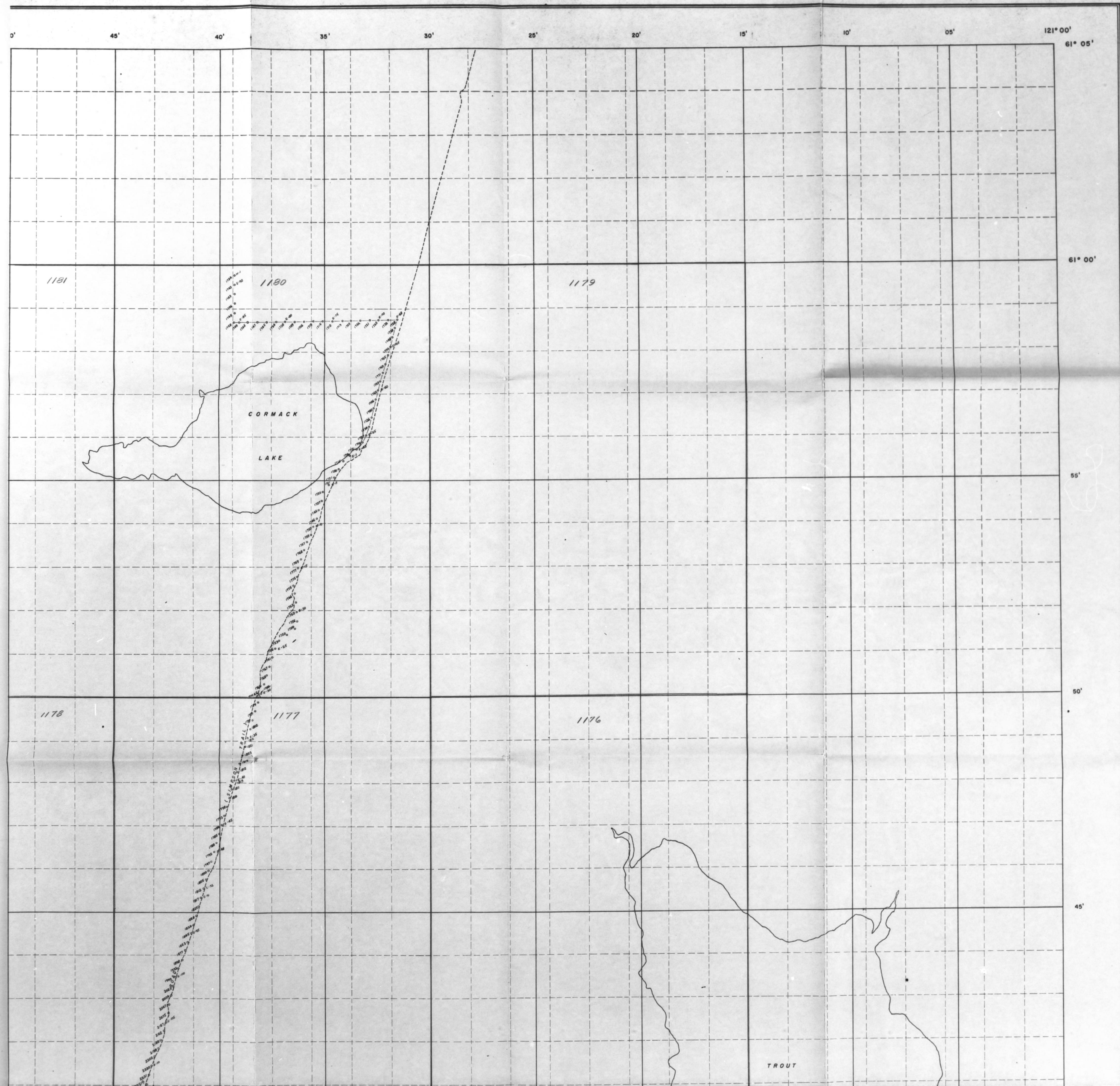


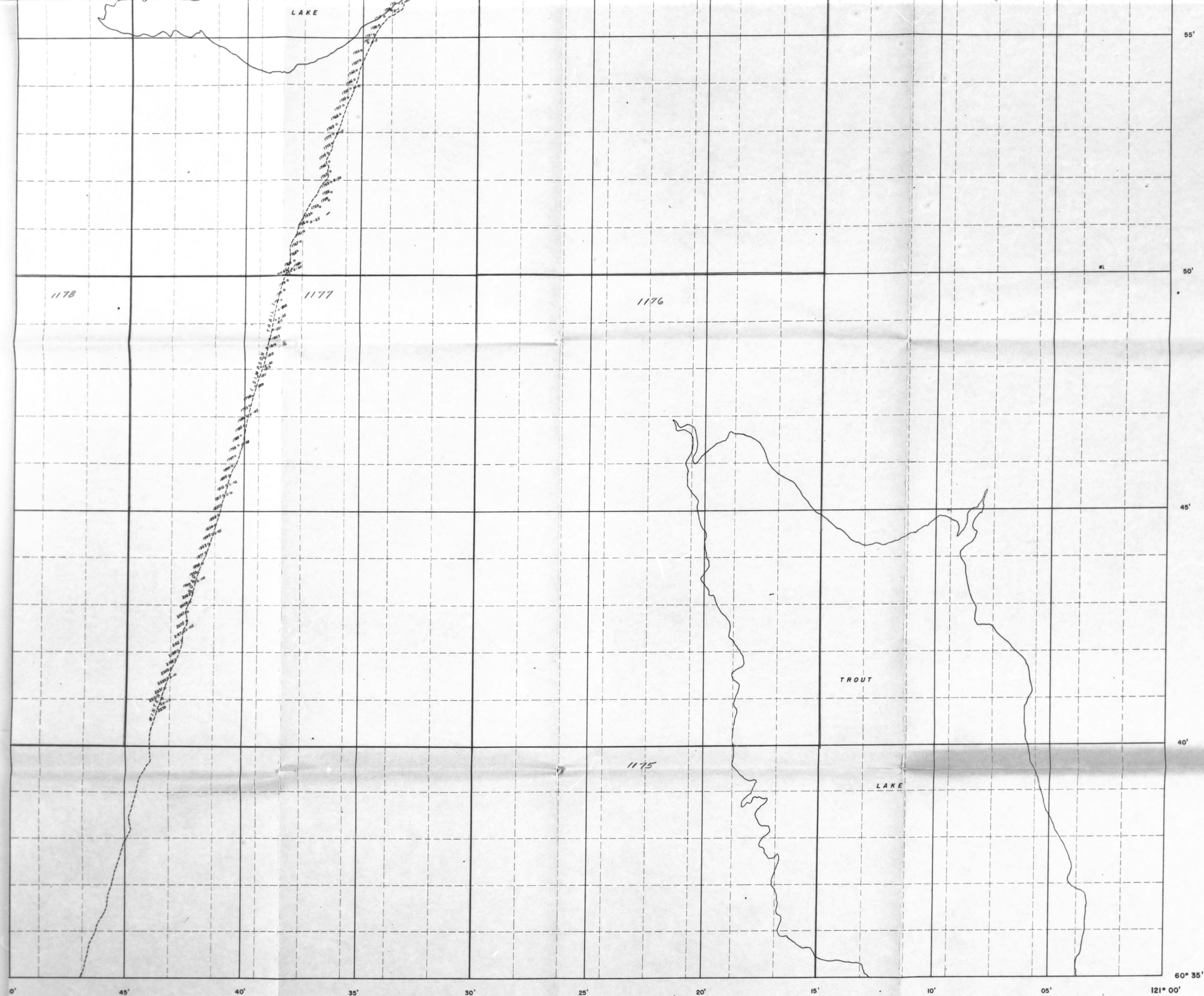


WELL LEGEND	
○	LOCATION
●	OIL WELL
✱	GAS WELL
◇	ABANDONED WELL

BULLDOZING: FEB-MAR 1960

HOME OIL COMPANY LIMITED	
LA BICHE - LIARD AREA	
NORTHWEST TERRITORIES	
DATUM PLANE	VELOCITY
CONTOUR INTERVAL	DATE
SCALE: 1" = 1 MILE	BY





EXPLORATION CONSULTANTS, INC.
CALGARY ALBERTA

REFLECTION SEISMOGRAPH SURVEY
FOR
HOME OIL COMPANY LIMITED
IN
TROUT LAKE AREA
NORTHWEST TERRITORIES
E1 - E113 - DEC. 1959 - JAN. 1960
SHOT POINT ELEVATION MAP

DATUM PLANE VELOCITY
CONTOUR INTERVAL DATE APR. 1960
SCALE: 1" = 1 MILE BY R.A. SCHWARTZ

Supplementing this Seismic Contractor's Report,
Horn Oil Company Limited has added three maps:

- (1) Contour Map - "C" Horizon - Top of Devonian. *not released*
- (2) Surface Elevation Map.
- (3) Shot Point Location Map.



SEISMIC SURVEY
of the
NORTH PETTIT AREA
NORTHWEST TERRITORIES

by
EXPLORATION CONSULTANTS, Inc.

Party Number 5,
1960

ABSTRACT

This report covers the seismic work conducted in the North Petitot Area, Permit Nos. 1151, 1152 and 1153 of the Northwest Territories by Exploration Consultants, Inc., Party No. 5 from December 11th, 1959 to December 18th, 1959.

During this period .6 crew months were spent on the prospect and the average production was 4 setups per 10 hour day.

The record quality is generally good over most of the area.

The principal objective of the survey was to map the attitude of the Devonian section for possible anomalies. Good continuous reflections were obtained from the top of the Devonian and from a shale member approximately 2000 feet below the Devonian top. The quality of the reflection from the Slave Point varies from fair to questionable. These identifications are based on a tie with Heiland records which in turn were tied to the Home Celibeta Well.

The most prominent feature in the area is a fault near S.P. E-12.

LOCATION AND DATE

The area covered by this report is called the North Petitot Area permit Nos. 1151, 1152 and 1153 and is located in the Northwest Territories from approximately longitude $122^{\circ} 00'$ to $121^{\circ} 40'$ and latitude $60^{\circ} 15'$. A tie was made to Heiland's S.P. H-573 on the west end of the line.

Exploration Consultants, Inc., Party No. 5 with C. W. Hayes as Party Manager and K. C. Hillstead as operator did the shooting covered by this report.

Work in the area was commenced on December 11th, 1959 and terminated on December 18th, 1959.

124.5 hours were required to shoot about 13 miles.

Total expenditure for this period was \$15,521.41. The cost per shot point was \$292.85, and the cost per drilled foot was \$.573. The crew averaged 4 set ups per 10 hour day. Forty-nine hours drive time from Calgary to the camp are incorporated in these figures for statistical purposes. Without the move time, production averaged 6.5 set ups per 10 hour day.

SURFACE CONDITIONS

The crew operated out of a bush camp on the Simpson Trail near S.P. E-1.

The surface elevations varied from +1843 feet at S.P. E-23 to +1604 feet near S.P. E-36. Horizontal control was run in with a transit and vertical control with an alidade.

Government monument #5 about one half mile south of S.P. E-1 was used to tie the horizontal control. The co-ordinates on this point are 60° 15' 44.5" latitude and 121° 45' 23.5" longitude. The control was started from Heiland's notes near their S.P. H-573. The mistle on this bench mark was 400 feet north and 100 feet east from the government bench mark.

The elevations were tied back to the starting elevation at S.P. H-573 with a misstie of .2 feet high.

The optimum shooting depth was about 40 feet.

Good record quality was general with the exception of a few isolated areas of muskeg.

Since the bush is light in the area the dozers encountered no particular problem other than blading a trail smooth enough for the equipment to travel at a reasonable speed.

SHOOTING AND RECORDING TECHNIQUES

Three hole patterns shot at about 40 feet produced the best reflections over the area. Nine 28 cycle Electro-Tech geophones spaced at 20 foot intervals were connected in series parallel to each recording channel (see diagram at end of report).

A modified Century recording unit A.V.C. and selective filtering in conjunction with an S.I.E. MR4 magnetic recording system was used for recording in this area. All shots were recorded through a 26-1-120 filter on the field monitor record and the magnetic tape. Each tape was played back through a 32-1-66 filter both straight and mixed. The mixing is a 50% B.A. mix which feeds from the top down on the upper 12 traces and from the bottom up on the lower 12 traces. The top trace or No. 1 is always north or east on the record.

From the corrected tapes, record sections were constructed using an out 1-65 filter, a fast A.V.C. and a 20%-60%-20% mix.

COMPUTING INFORMATION

It was necessary to shoot a long-ender or a spread of 0-2640

at each hole in order to obtain arrivals from the high velocity strata.

A curve path method of computation was used to reduce the uncorrected times to a datum of +1400 feet.

A refraction method of computation was also employed as an added check of the computing procedure used. The two methods checked reasonably well.

The depth of drift varied over the area from a maximum of about 1300 feet to a minimum of about 400 feet. The refraction velocities indicated a 6000 $'/''$ drift layer with an underlying velocity of about 9000 $'/''$.

MAPS

No contour maps are submitted since the present work is added control to previous shooting by Heiland Geophysical Company.

Most of the records in the area are suitable for correlation.

An elevation map included with the

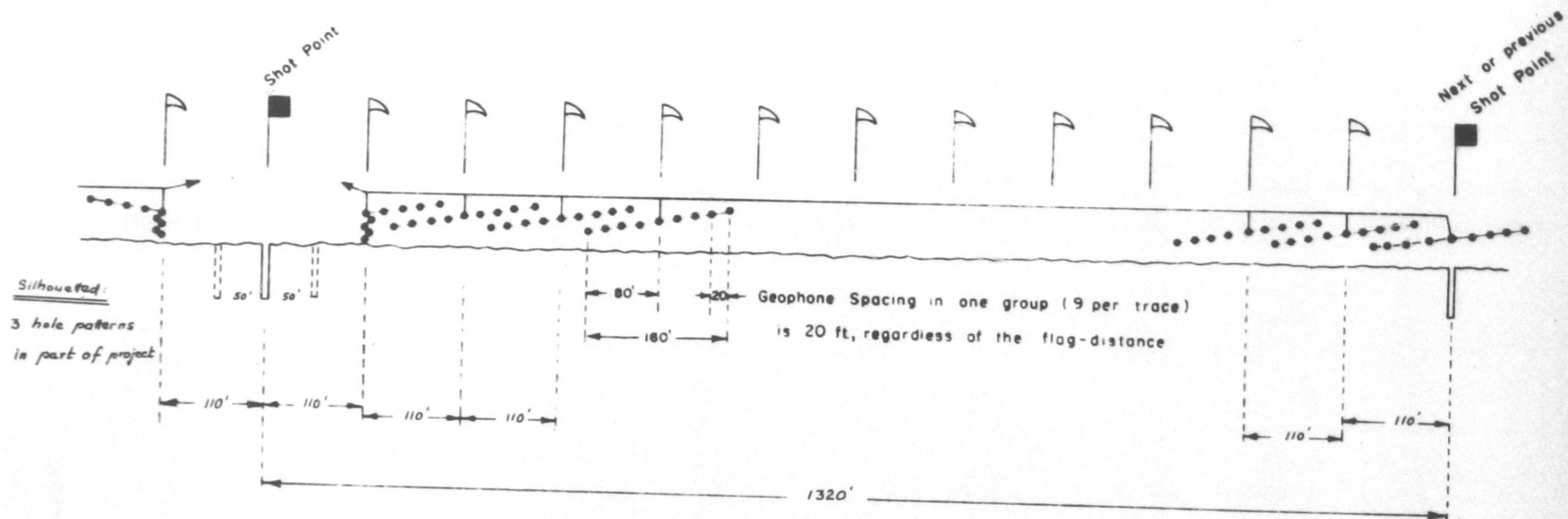
Respectfully submitted,

EXPLORATION CONSULTANTS, INC.

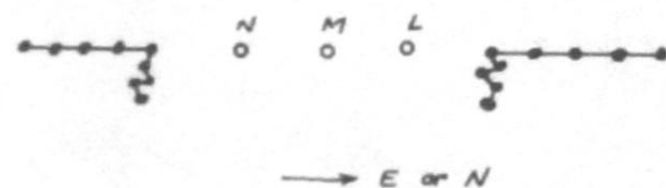
Bob A. Schwartz
R. A. Schwartz, Party Chief.

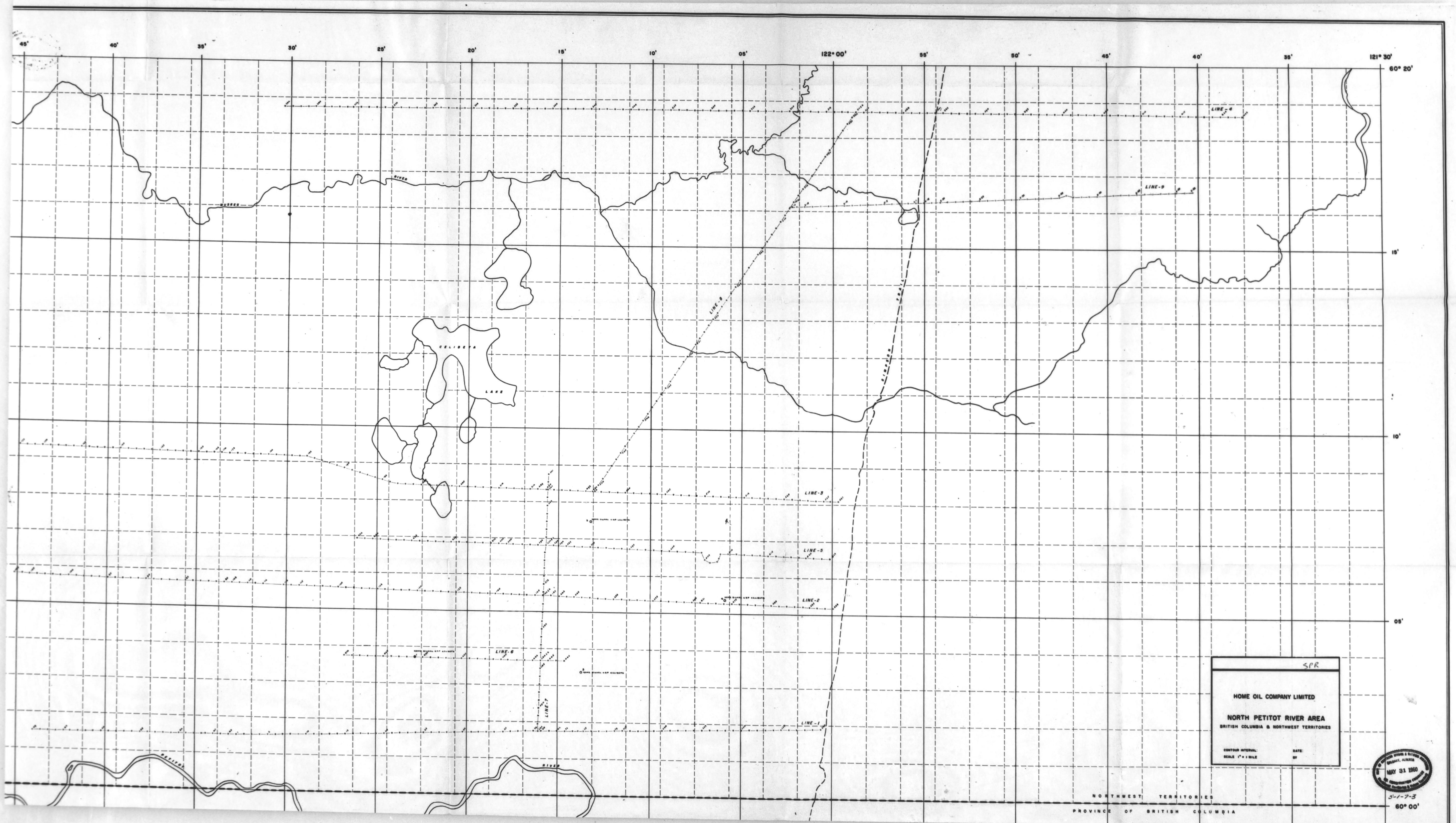
N. J. Christie
N. J. Christie, President

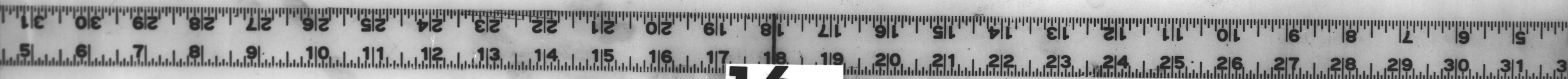
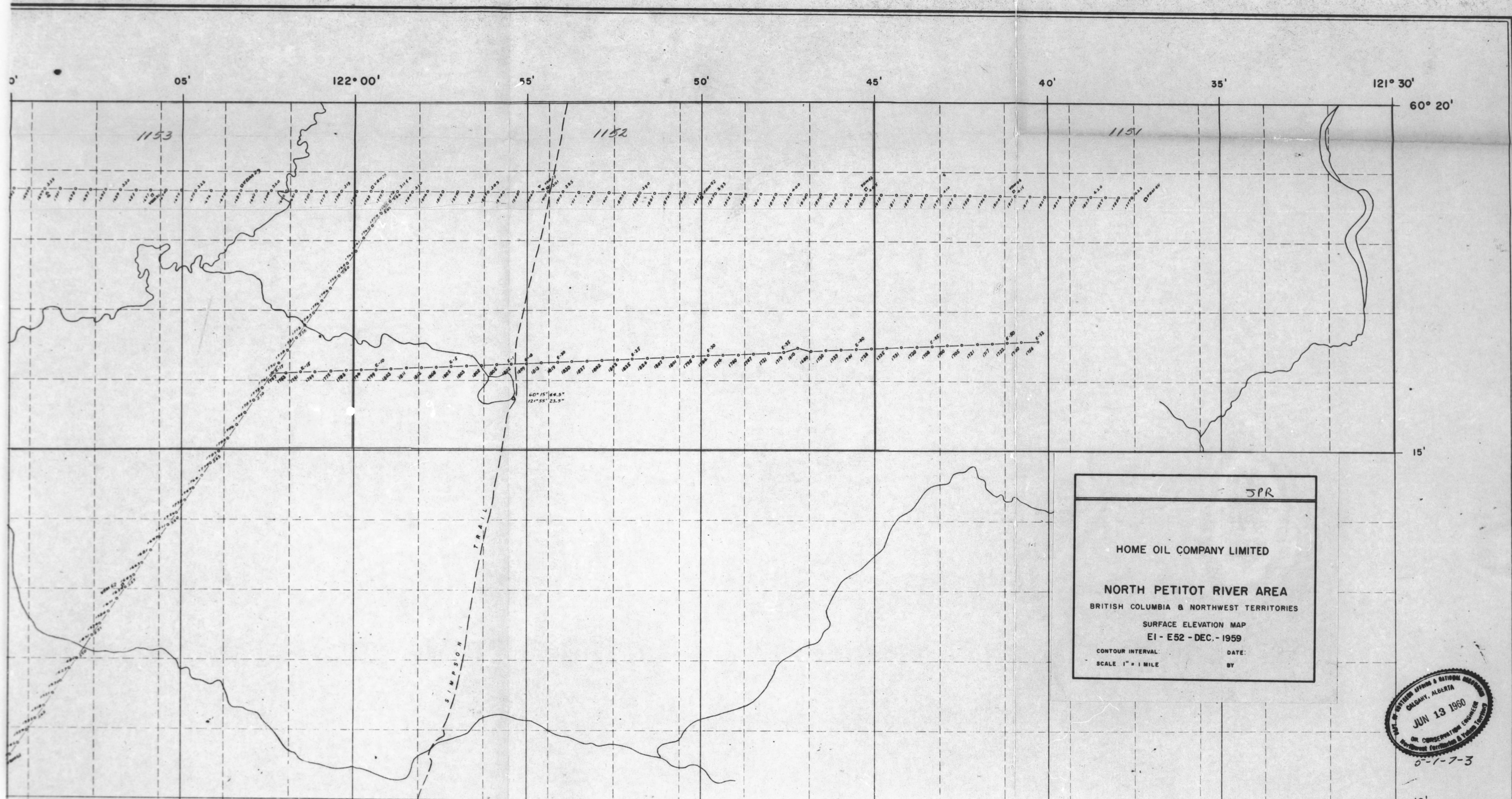
Geophone arrangement and spread length used



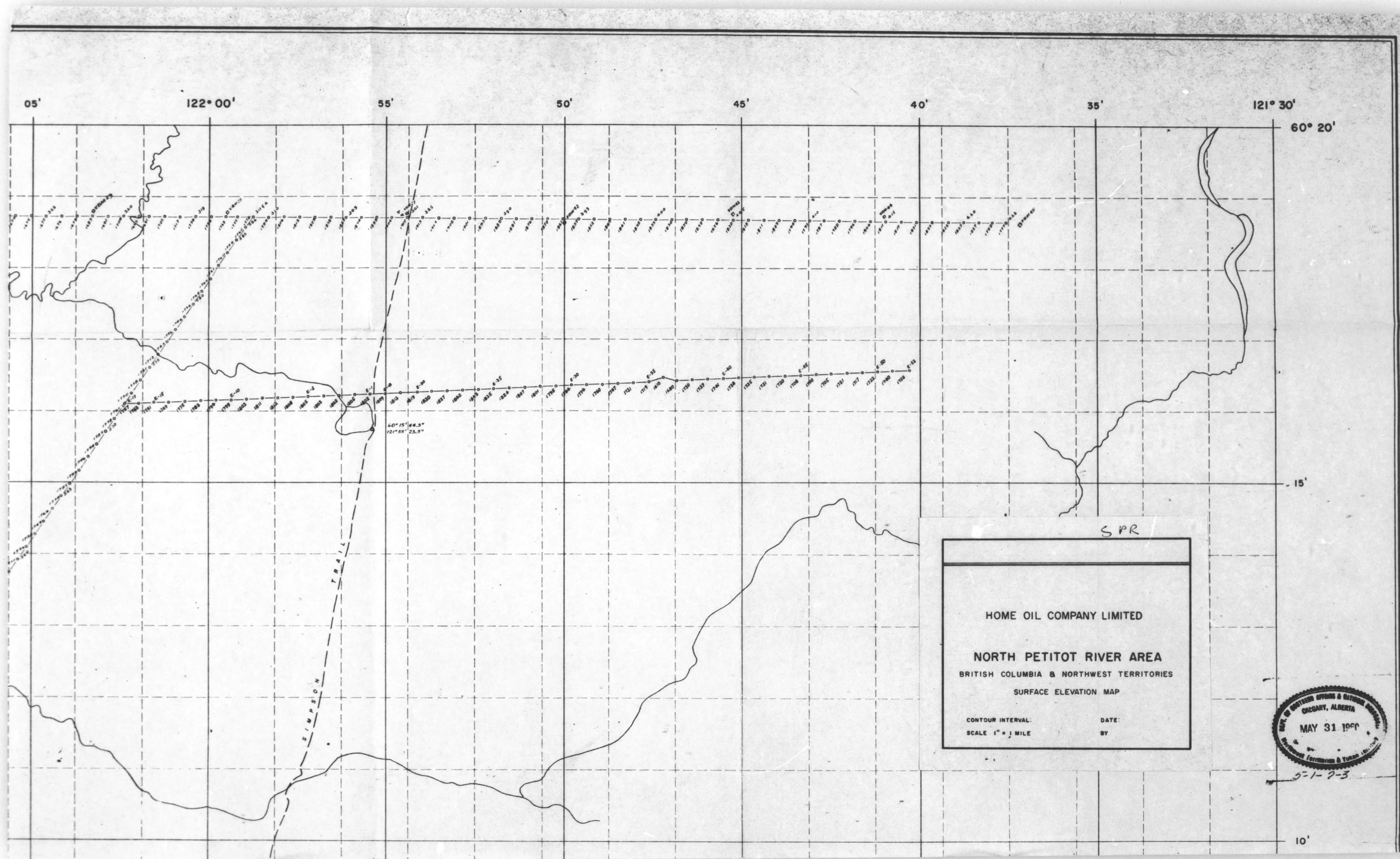
Shot pattern diagram



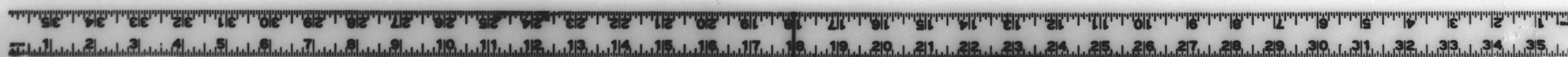
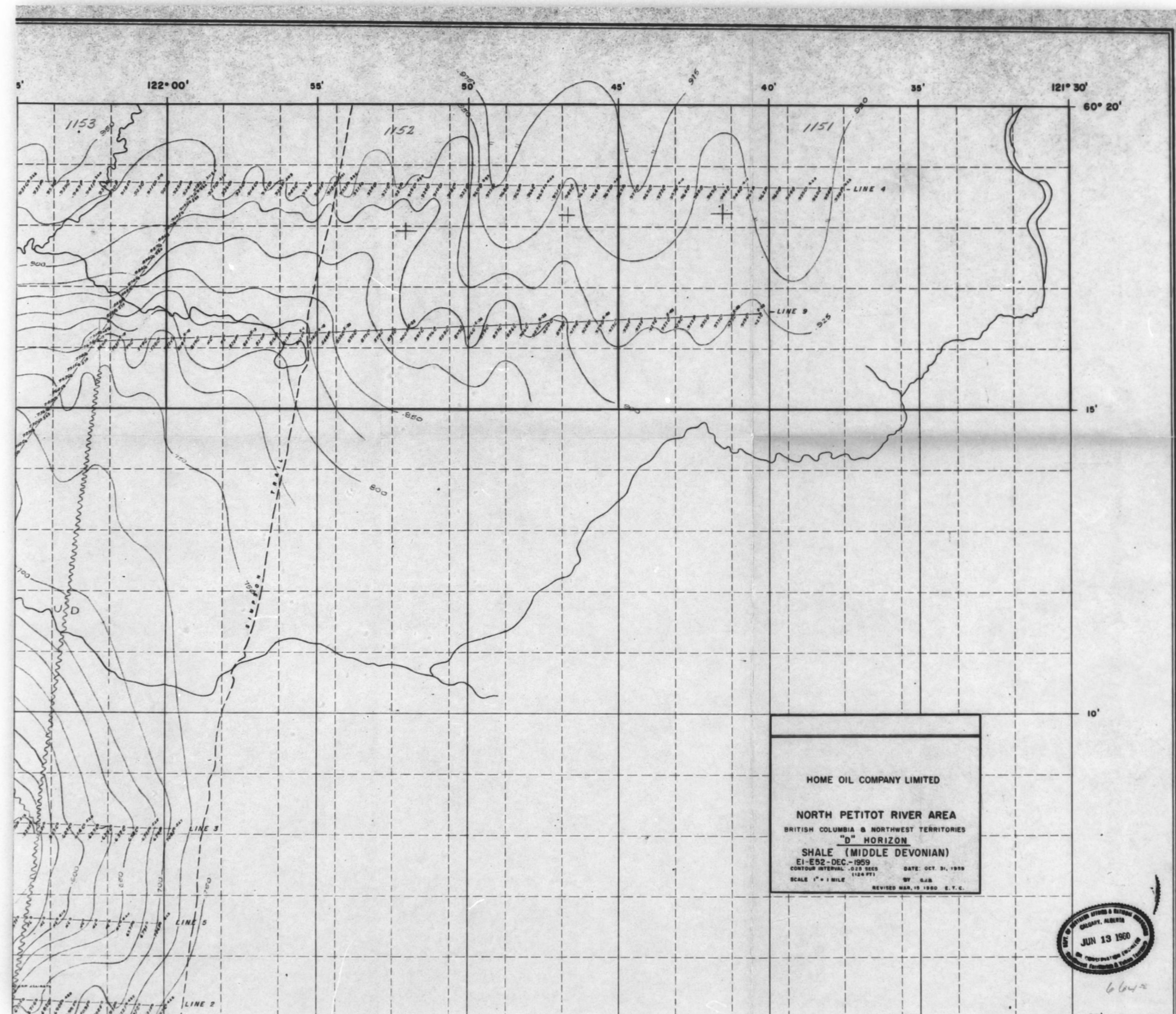




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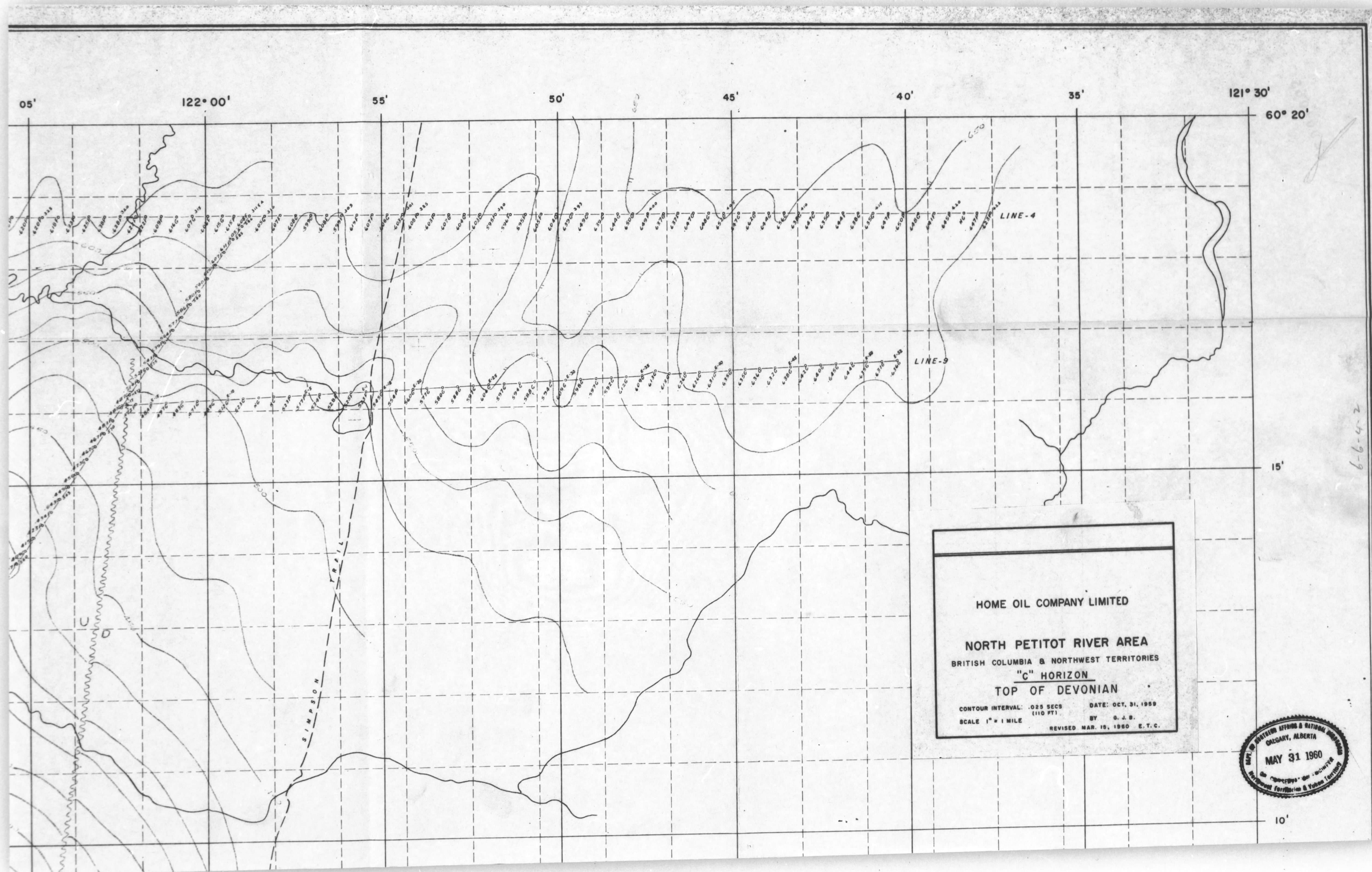


16x



30x

West Canadian Graphic Industries Ltd.



16x

SEISMIC SURVEY

of

LA BICHE LIARD RIVER AREA

REGS PERMIT 1132

and

CANADA SOUTHERN PETROLEUM PERMIT 1525

by

EXPLORATION CONSULTANTS, INC.

May 12th, 1960



EXPLORATION CONSULTANTS, INC.

209A - 6TH AVENUE SOUTH WEST
CALGARY, ALBERTA

ABSTRACT

This report covers the seismic work conducted in the Liard River Area of the Northwest Territories covering Home Oil Permit #1132 and the Canada Southern Petroleum Permit #1525, shot by Exploration Consultants, Inc. Party #5 from January 28th 1960 to February 23rd, 1960.

During this period 1.9 crew months were spent on these permits and the average production was 5.1 setups per ten hour day.

The record quality varied from questionable to good.

The principle objective of the survey was to check the attitude of the subsurface horizons for possible major faulting in the area.

There are two faults of interest in the area, both of which appear to be striking in a north-north easterly direction.

LOCATION AND DATE

The area covered by this report includes permits #1132 for Home Oil and #1525 for Canada Southern Petroleum and is located in the Northwest Territories along the Liard River from longitude $123^{\circ} 10'$ to $123^{\circ} 30' W$ and latitude $60^{\circ} 20'$ to $60^{\circ} 40' N$.

Exploration Consultants, Inc. Party #5 with C.W. Hayes as Party Manager and K.C. Hillstead as operator did the shooting covered by this report.

Work in this area commenced on January 28th, 1960 and was completed on February 23rd, 1960.

The nearest shooting is a north - south line along the eastern boundary of the surveyed area.

In the Home Oil section of the shooting 177 hours were required to shoot 74 holes, a distance of about 18 miles.

Total expenditure for this period on the Home Oil section was \$21,473.96. The cost per shot point was \$290.19 and the cost per drilled foot was \$.649. The crew averaged 4.4 setups per 10 hour day.

On the Canada Southern Petroleum portion, 231 hours were required to shoot 132 holes, a distance of about 33 miles.

The total expenditure for the Canada Southern portion of the survey was \$30,669.39. The cost per shot point was \$232.34 and the cost per foot drilled was \$0.523. The crew spent 1.1 crew months to complete the prospect and averaged 5.7 set ups per 10 hour day.

For statistical purposes the drive time to the area was included with the Canada Southern time and the drive time to Calgary was added to the Home Oil portion of the survey.

SURFACE CONDITIONS

The crew operated out of a camp on the shore of a lake at S.P. #1.

The surface elevations varied from - 815 ft. at S.P. #88 to + 1416 ft. at S.P. #58. Horizontal control was run in with a transit and vertical control was run in by alidade.

An elevation given as + 961[±] on the lake at the camp near shot point #1 was used as a basis for vertical control. All lines were tied back to this original elevation. A previously dozed north-south line was used to tie loops along the eastern border of the survey.

The northern loop from S.P. #92 to the lake tied 3.6 ft. low. The southern loop, from Home Oil's S.P. #E-68 back through Canada Southern S.P. #123 to the lake tied 0.4 ft. low.

The transit survey is based on the location of the lake on the National topographic map, Ft. Liard sheet 95B. A polaris shot was used for the correct azimuth and rectangular co-ordinate computations were used to establish the locations on the map. Between S.P.'s 34 and 35, line #1, a resection was performed to determine the location of this point. Two recognizable points that could be correlated with points on the map were shot in on a bend in the river. It was found that the error in the topographic sheet from the lake to the river was about $\frac{1}{2}$ mile. The river is $\frac{1}{2}$ mile closer to the line than is shown on the map.

There is considerable variation of the optimum shooting depth, although about 60 foot holes were generally adequate.

The record quality varied considerably over the area. The poorest records were obtained in low-lying areas of muskeg.

No particular problem was encountered with the dozing since the bush is fairly light.

The main concern was accessibility, since it required about 15 hours driving time by pickup to Fort Nelson by way of the Simpson Trail.

SHOOTING AND RECORDING TECHNIQUES

Three hole patterns at 50 ft. apart improved the record quality in some areas and in others there was little difference. Nine 28 cycle Elektro-Tech geophones spaced at 20 ft. intervals were connected in series parallel to each recording channel. (see diagram at end of report).

A modified Century recording unit with A.V.C. and selective filtering in conjunction with an S.I.E. MR4 magnetic recording system was used for recording in this area. All shots were recorded through a 26-1-120 filter on the field monitor record and the magnetic tape. Each tape was played back through a 32-1-66 filter both straight and mixed. The mixing is a BA 50% mix which feeds from the top down on the upper 12 traces and from the bottom up on the lower 12 traces. The top trace or No. 1, is always north or east on the record.

The record sections were constructed from the corrected tapes using an out 1-65 filter, a fast A.V.C. and a 20% - 60% - 20% mix.

COMPUTING INFORMATION

An end on spread of 0-2640 was shot at each hole in order to obtain arrivals from the higher velocity strata beneath the drift. Generally the shorter spread of 0-1320 was long enough to obtain these arrivals, however, there were areas where the longer spreads were necessary.

A curve path method of computation was used to reduce the uncorrected times to a datum of + 1,000 ft.

The thickness of drift varied over the area from about 60 ft. to about 700 ft. The average thickness was about 200 ft. The refraction velocities obtained from the drift were about 6,000 ft./sec. while the refraction velocities from beneath the drift were generally 10,000 ft./sec. or higher. Some variation could be expected in this zone depending on the velocity of the outcropping beds beneath the drift.

MAPS

Submitted with this report are 5 horizon maps. No identifications were made and they are lettered as A, B, C, D and E.

The regional dip on all horizons is to the south.

In addition to the horizon maps there is an elevation map and magnetic tape index map. Record playback sections - (a) wiggly trace

and (b) 1 from 3 composite), and normal time sections are also included with this report.

INTERPRETATION

It was of primary interest to locate any possible major faulting in the area.

There are two faults of significance encountered by this survey. The direction of one is fairly well defined in the Canada Southern portion of the area. On the "E" horizon this fault appears as a graben at S.P. No. 72 and as a normal fault between S.P. No. 45 and S.P. No. 46, then apparently dies out to the south. The "D" reflection is very poor in the vicinity of the fault, consequently the exact location of the fault through this zone is not known. There is also a low angle underthrust associated with this fault zone which can be traced on the north line in an easterly direction almost to the end of the line near S.P. No. 92.

The fault in the Home Oil area appears as a graben at S.P. No. E-36 and as a normal fault between S.P. No. E-66 and E-67. These two faults were connected since the direction is comparable to the northern fault.

A deep reflection at about 1.6 seconds at S.P. No. 1 could be a multiple. From the normal moveout the average velocity to this event computed out to be about 9500 ft. per second which is assumed to be too low a velocity at that depth.

CONCLUSIONS

Although there is some evidence of closure in the vicinity of these faults such as the high at S.P. No. 96, the south plunge of all horizons is approximately 220 feet per mile which may rule out the possibility of significant closures along the fault traces.

The greatest amount of throw encountered could be about 1,000 feet where the fault cuts the "E" horizon on the most northerly line. Due to poor reflection character in the faulted zones it was difficult to establish the amount of throw accurately.

ACTION

An approximation should be made from the geological data on hand as to the identifications of the horizons mapped.

Judging from the very strong south dip encountered, the area surveyed could be the south flank of a large feature north of this area.

The contractor is indebted to Mr. E.T. Cook of Home Oil Company, Geophysical Department for his help and co-operation during the survey.

Respectfully submitted,

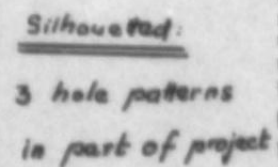
EXPLORATION CONSULTANTS, INC.

Bob A. Schwartz
R. A. Schwartz, Party Chief.

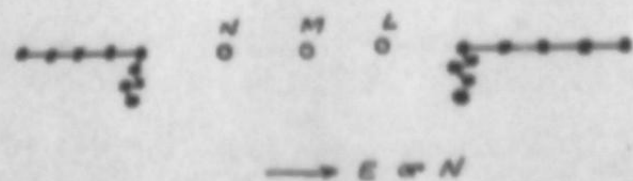
Norman J. Christie
Norman J. Christie, President.

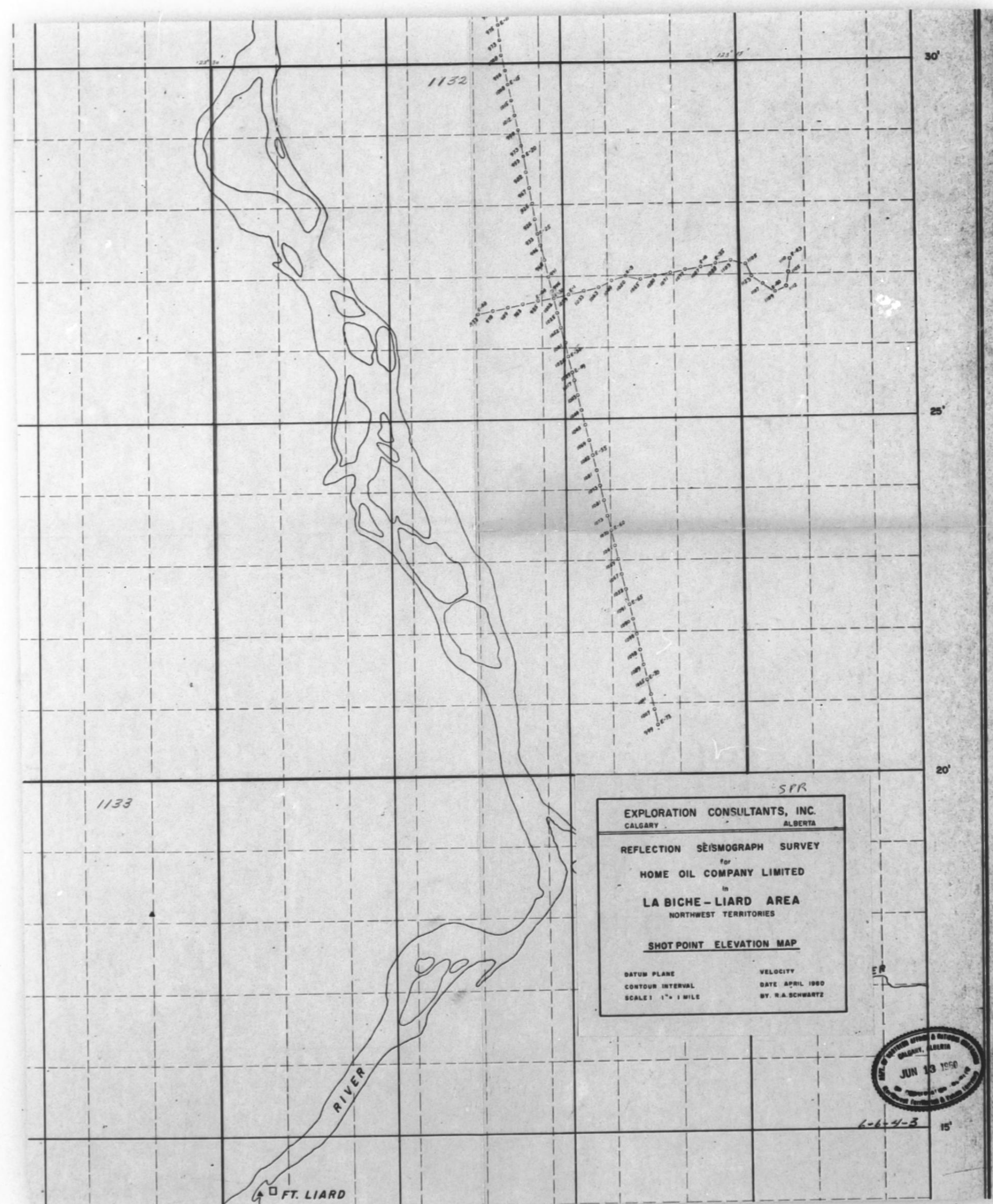
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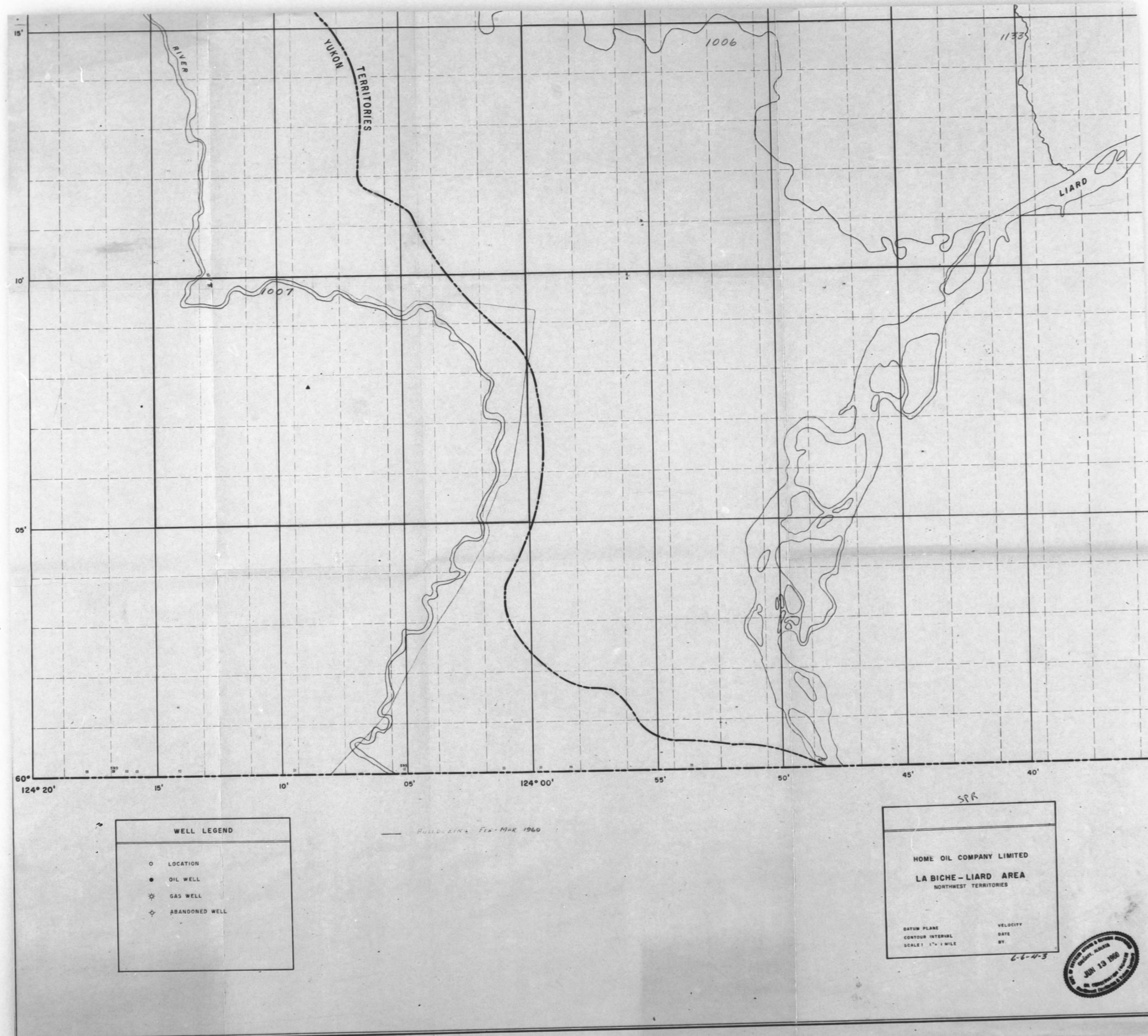
Geophone arrangement and spread length used

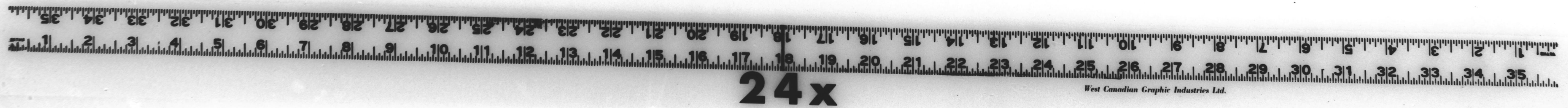
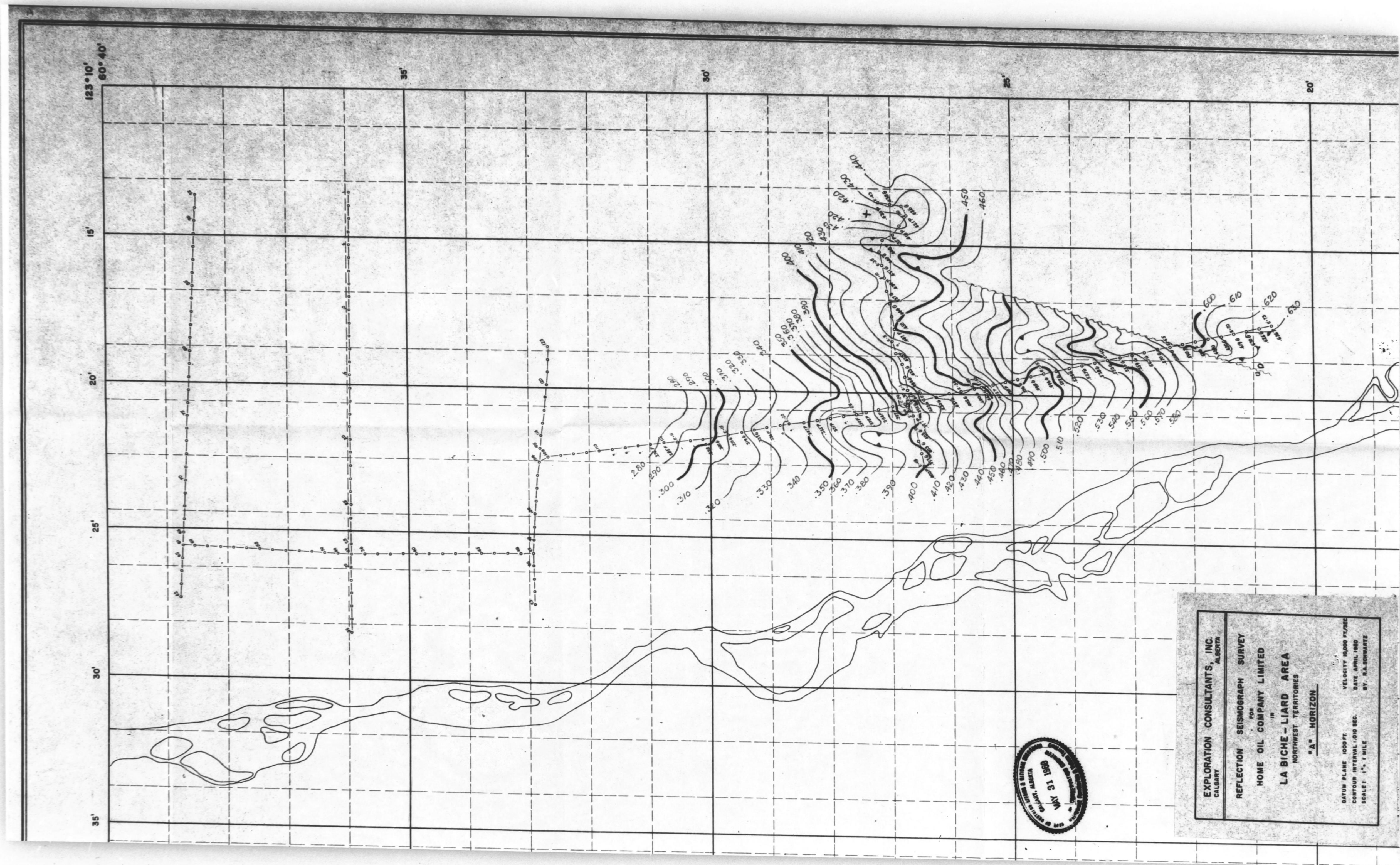


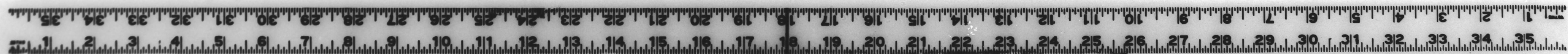
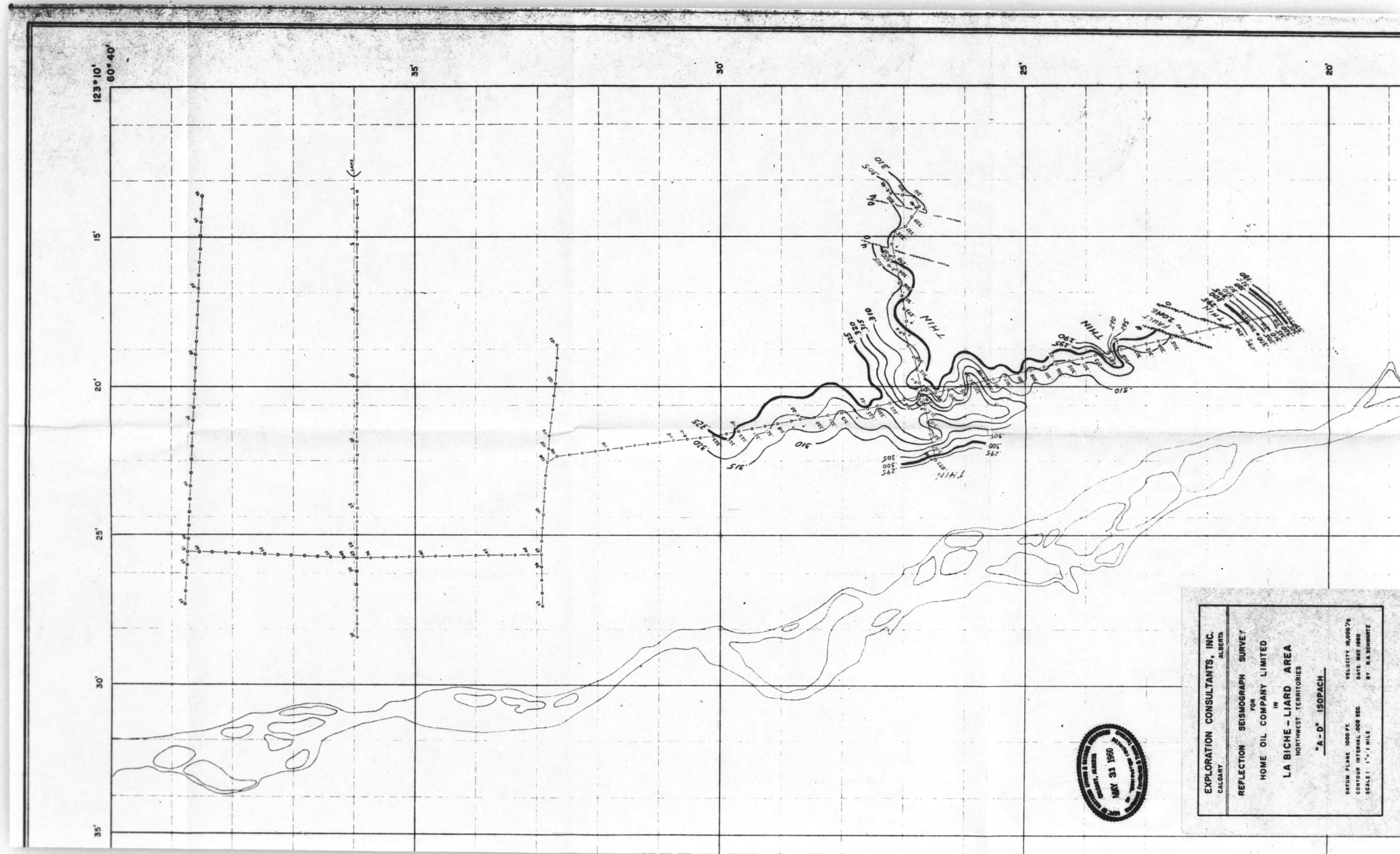
Shot pattern diagram



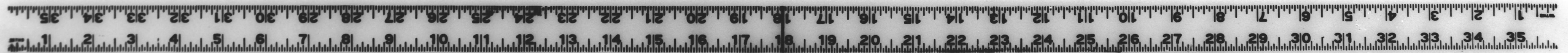
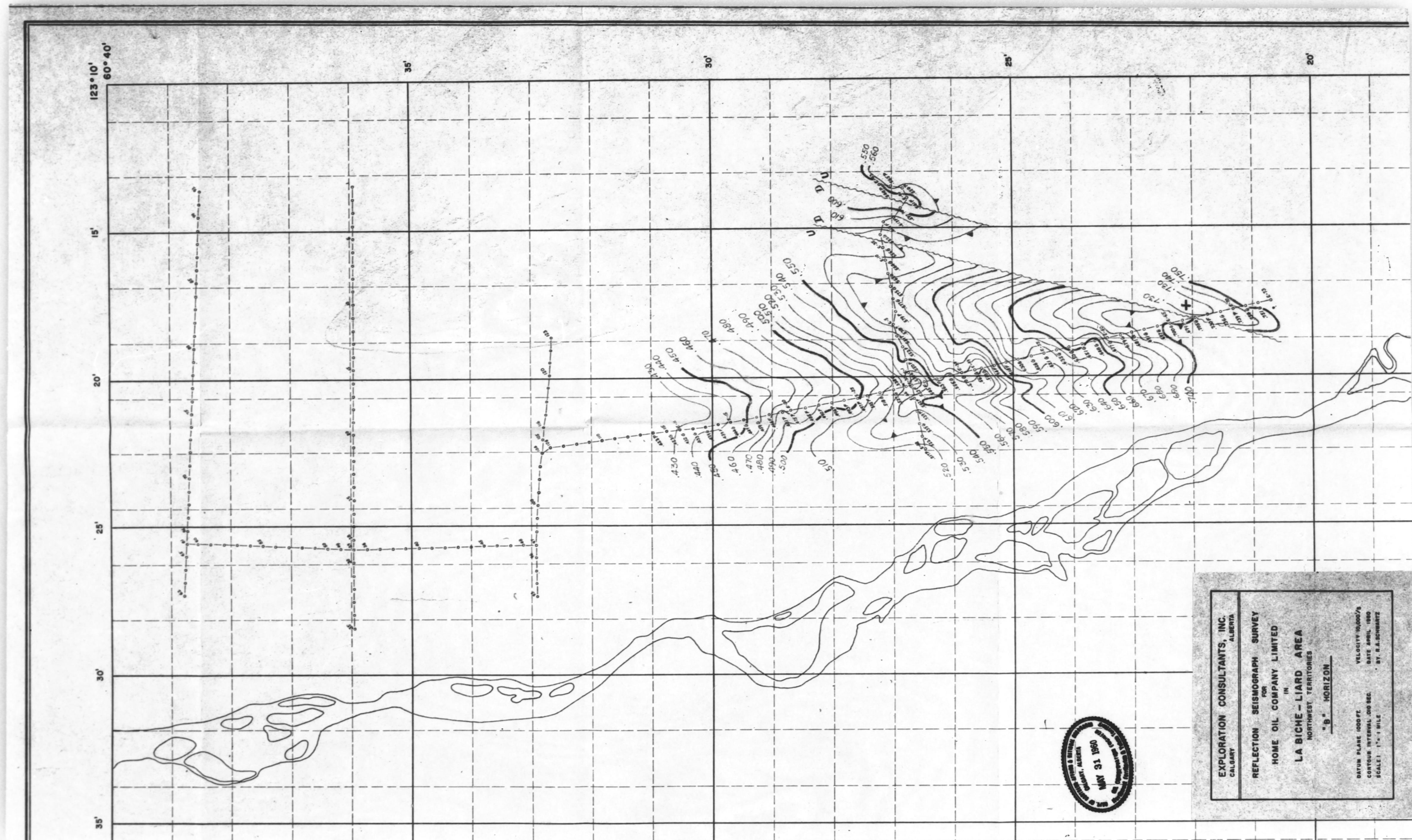






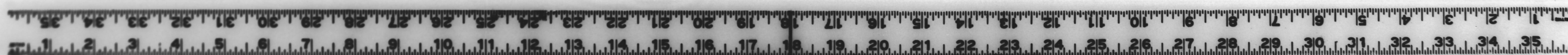
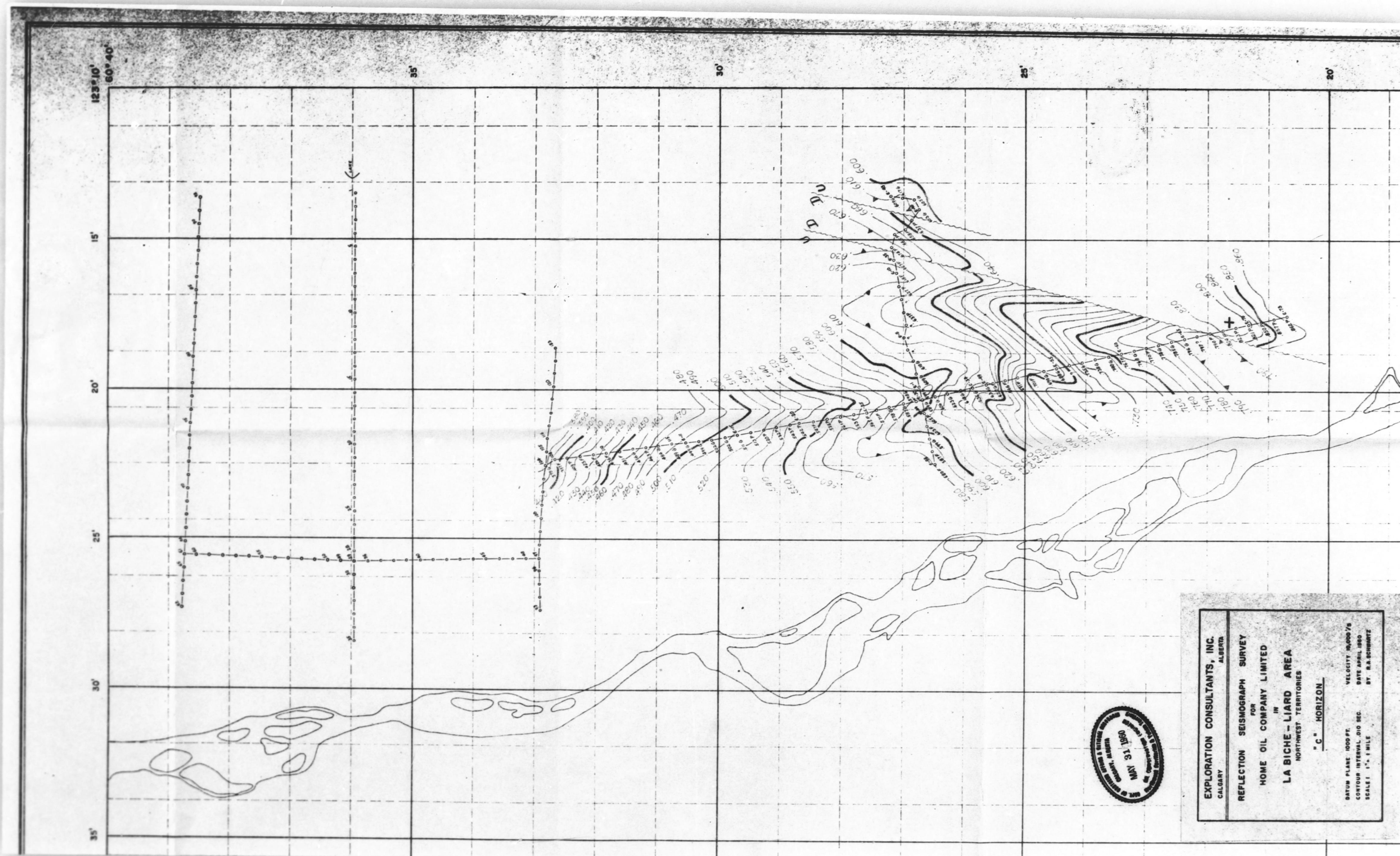


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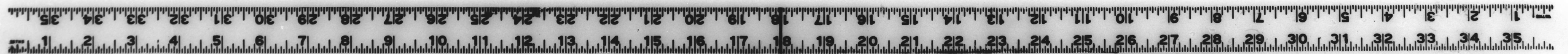
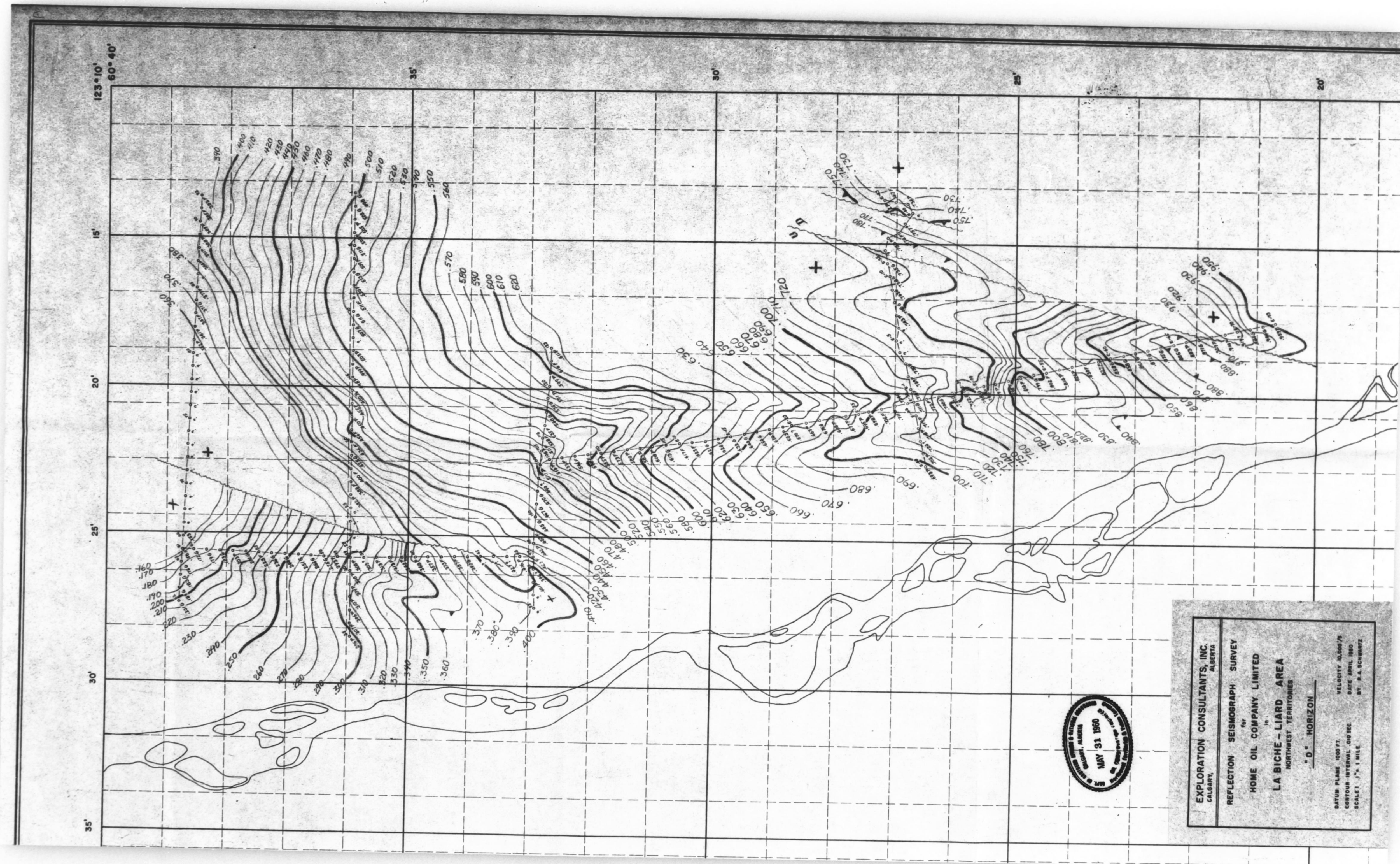
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West Canadian Graphic Industries Ltd.

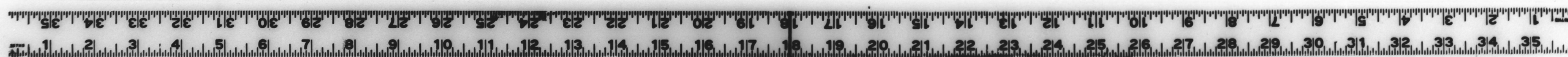
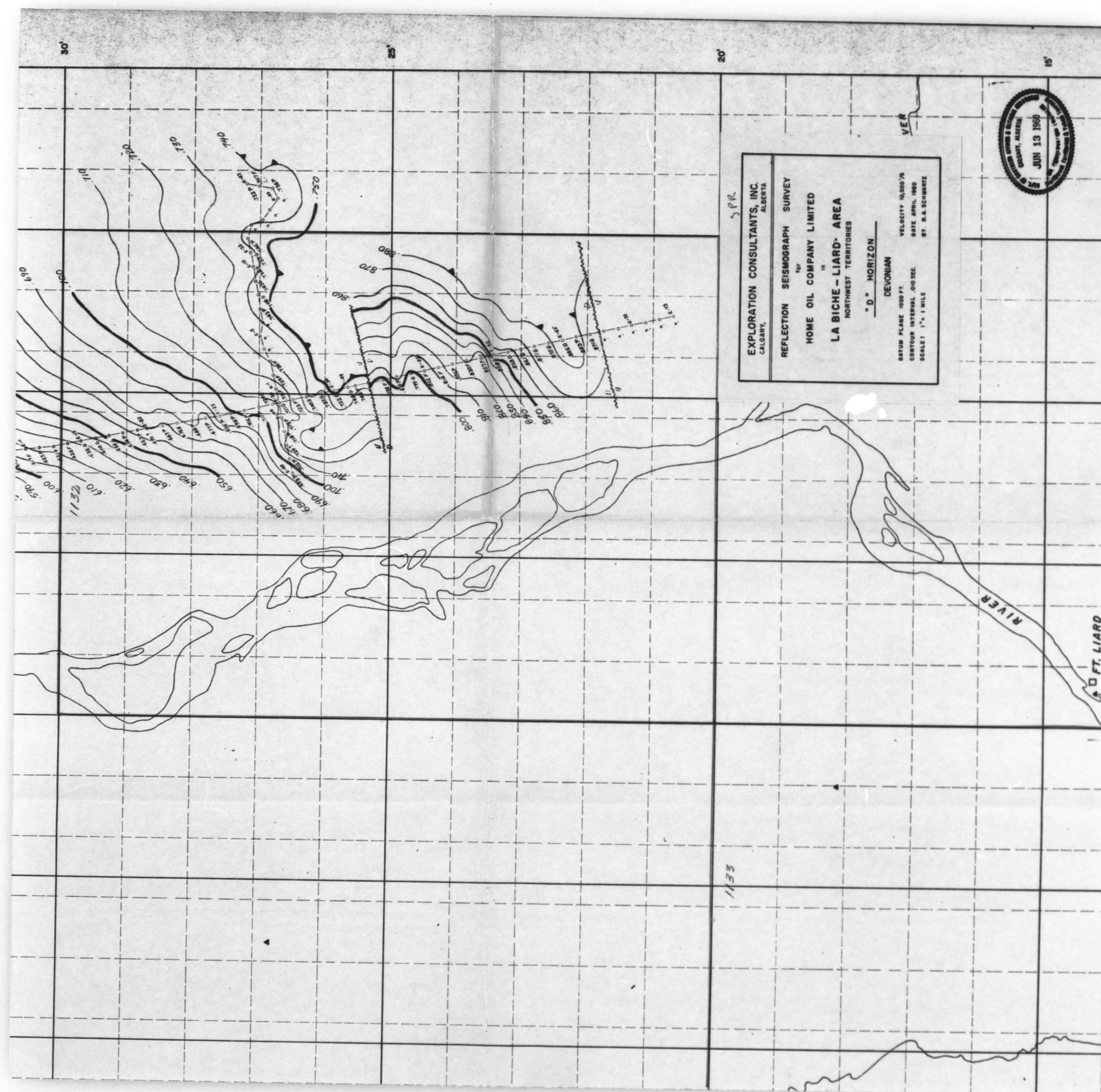


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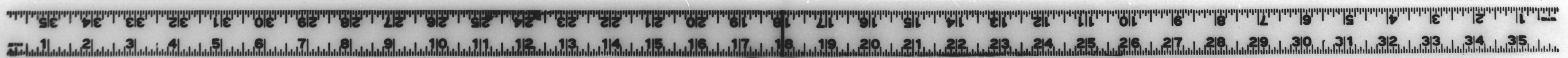
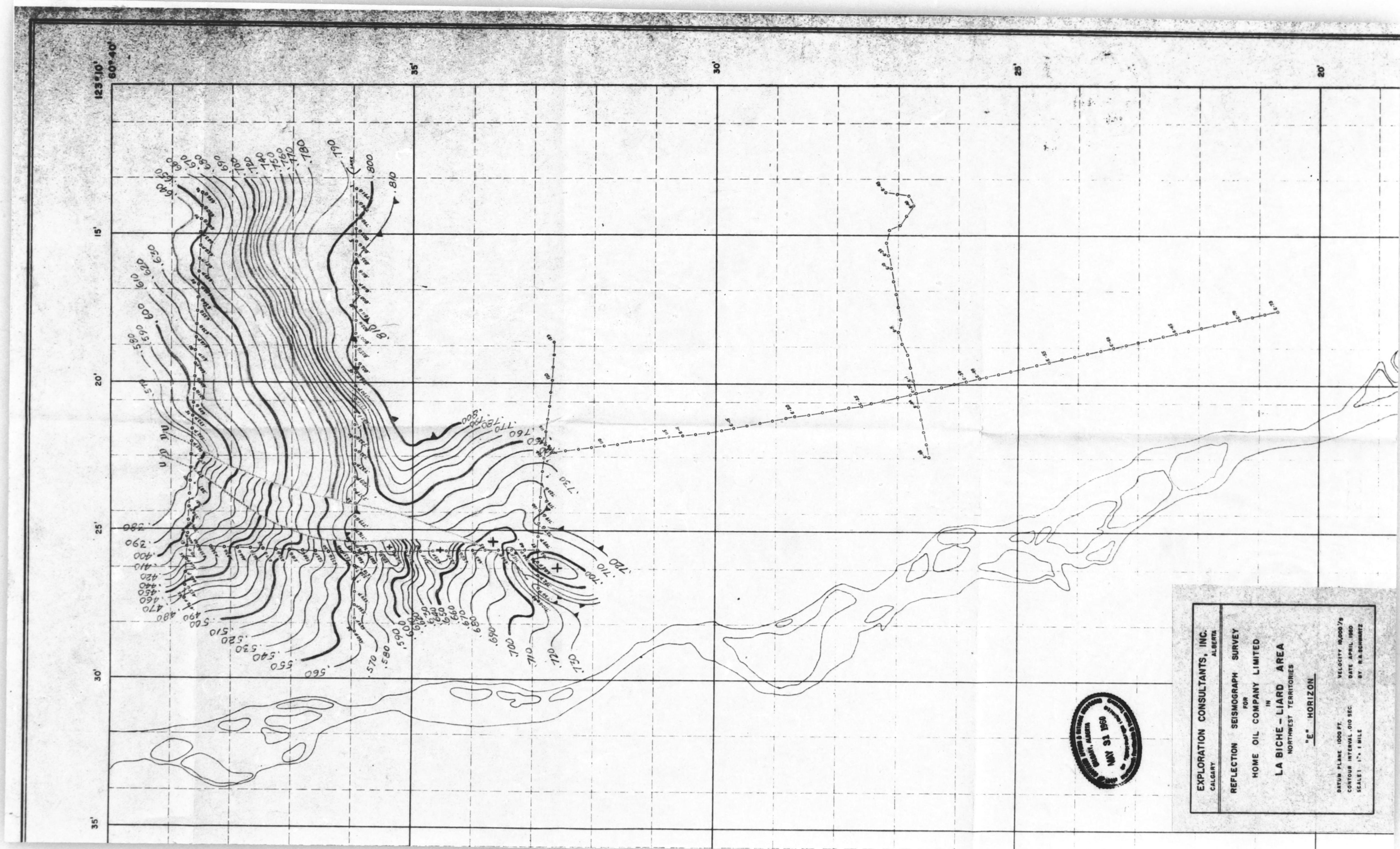
West Canadian Graphic Industries Ltd.



24x



24x



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